Utah Water Supply Outlook Report

February 1, 2018

Upper Joes Valley SNOTEL, January 26, 2018

Photo by: Kent Sutcliffe

Water Supply Outlook Reports
and Federal - State - Private Cooperative Snow Surveys

For more water supply and resource management information, contact: your local Natural Resources Conservation Service Office or:
Snow Surveys
245 N Jimmy Doolittle Rd, SLC Utah, 84116. Phone (801)524-5213
Internet Address: http://www.ut.nrcs.usda.gov/snow/

How forecasts are made

Most of the annual streamflow in the western United States originates as snowfall that has accumulated in the mountains during the winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Measurements of snow water equivalent at selected manual snowcourses and automated SNOTEL sites, along with precipitation, antecedent streamflow, and indices of the El Niño / Southern Oscillation are used in statistical and simulation models to prepare runoff forecasts. Unless otherwise specified, all forecasts are for flows that would occur naturally without any upstream influences.

Forecasts of any kind, of course, are not perfect. Streamflow forecast uncertainty arises from three primary sources: (1) uncertain knowledge of future weather conditions, (2) uncertainty in the forecasting procedure, and (3) errors in the data. The forecast, therefore, must be interpreted not as a single value but rather as a range of values with specific probabilities of occurrence. The middle of the range is expressed by the 50% exceedance probability forecast, for which there is a 50% chance that the actual flow will be above, and a 50% chance that the actual flow will be below, this value. To describe the expected range around this 50% value, four other forecasts are provided, two smaller values (90% and 70% exceedance probability) and two larger values (30%, and 10% exceedance probability). For example, there is a 90% chance that the actual flow will be more than the 90% exceedance probability forecast. The others can be interpreted similarly.

The wider the spread among these values, the more uncertain the forecast. As the season progresses, forecasts become more accurate, primarily because a greater portion of the future weather conditions become known; this is reflected by a narrowing of the range around the 50% exceedance probability forecast. Users should take this uncertainty into consideration when making operational decisions by selecting forecasts corresponding to the level of risk they are willing to assume about the amount of water to be expected. If users anticipate receiving a lesser supply of water, or if they wish to increase their chances of having an adequate supply of water for their operations, they may want to base their decisions on the 90% or 70% exceedance probability forecasts, or something in between. On the other hand, if users are concerned about receiving too much water (for example, threat of flooding), they may want to base their decisions on the 30% or 10% exceedance probability forecasts, or something in between. Regardless of the forecast value users choose for operations, they should be prepared to deal with either more or less water. (Users should remember that even if the 90% exceedance probability forecast is used, there is still a 10% chance of receiving less than this amount.) By using the exceedance probability information, users can easily determine the chances of receiving more or less water.

STATE OF UTAH GENERAL OUTLOOK
February 1, 2018

SUMMARY

January was not the month we had hoped for, and while we're not sitting quite as badly as the end of last month, we didn't improve much, if any, in the way of snowpack. Thanks to two storms in January, snowpack in Southern Utah has been pulled out of below abysmal up to just abysmal. So now instead of being the worst snowpack on record, most of the basins south of Provo fall within the worst five years on record. Values of percent normal snow water equivalent (SWE) in Southern Utah range from 33% in Beaver up to 51% in the Lower Sevier. Basins north of Provo didn't see much in the way of improvement but also didn't lose much ground. Percent normal SWE values on the Bear River Basin dropped a few percentage points to 78% while the Northeastern Uinta Basin increased to 88% of normal. The rest of the northern basins range from 49% to 58% of normal. Excluding our two most northern basins, Utah is sitting in the 50% or less range and changes in the future weather pattern are not promising. With continuing below-normal conditions and now with one less month of snow accumulation, our chances of getting back to an average snowpack year continues to dwindle, with a 20% chance on the Bear River and North Slope of the Uintas, and 10% or less in the rest of the Utah basins. With already melted-out low elevation snowpack in many areas and ripe snowpack at mid-elevation sites, water managers should anticipate inefficient runoff and reduced and stream flow conditions. One bright point to this grim water story is that the statewide average reservoir storage is at 73% capacity, compared to 53% last year due to a substantial carryover from the previous water year.

SNOWPACK

February 1st snow packs as measured by the NRCS SNOTEL system are below normal across the entire state. In Southern Utah: Southwestern, Escalante, Southeastern, and Beaver basins range from 33% to 37%. The Sevier, Dirty Devil, San Pitch, and Price & San Rafael basins range from 39% to 51%. North of Provo the percent normal ranges from 49% at Tooele up to 88% on the Northeastern Uinta Basin.

PRECIPITATION

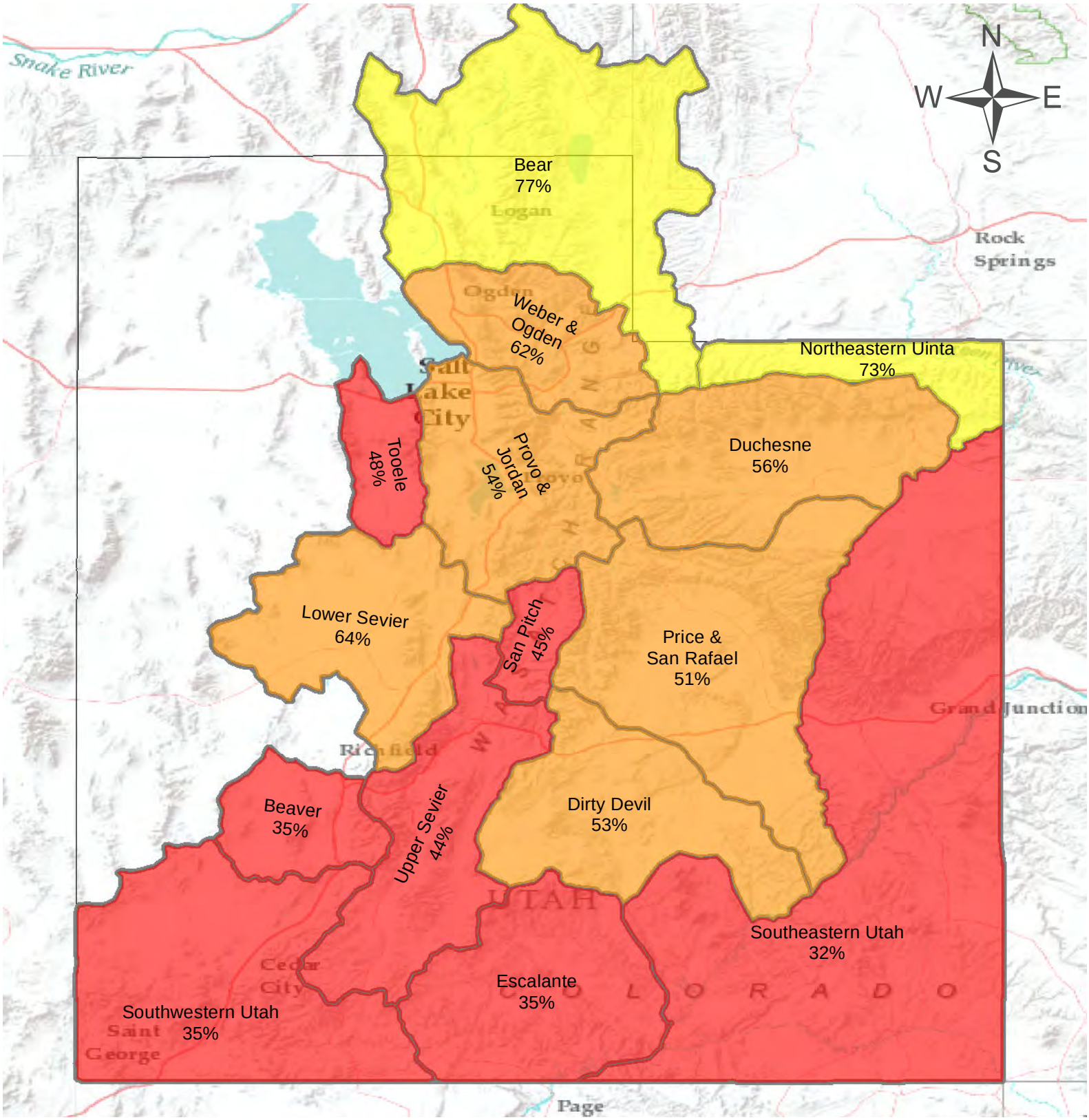
January precipitation across the state ranged from above average at 125% on the Lower Sevier to below average in Southeastern Utah at 61% of average with most basins ranging in the 60 to 80% range. This brings the statewide seasonal accumulation (Oct-Dec) to 58% of average. This is exceptionally dry, more so in the south, a little better in the north, coincident with La Nina conditions.

RESERVOIRS

Reservoir storage is in excellent condition at 73% of capacity statewide compared to 53% of capacity last year. Given current streamflow expectations, most areas will be heavily dependent on reservoir storage this next agricultural season. Water users dependent on these systems will likely face shortages.

STREAMFLOW

Streamflow forecasts across the state range from 6% to 88%. Water managers should be prepared for potentially record-low flows across Southern Utah and some areas of Northern Utah, and should prepare accordingly. The Bear River and Northeastern Uintas forecasts range from 55% to 88%. The rest of the northern basin forecasts are in the 50% to 70% range, and forecasts for basins south of Provo are in the 30% to 50% range. The long term outlook from the National Climate Prediction Center show below normal precipitation for Southern Utah and equal chances for Northern Utah, adding urgency for long range drought preparations across the state.



Statewide Precipitation

As of February 1, 2018:

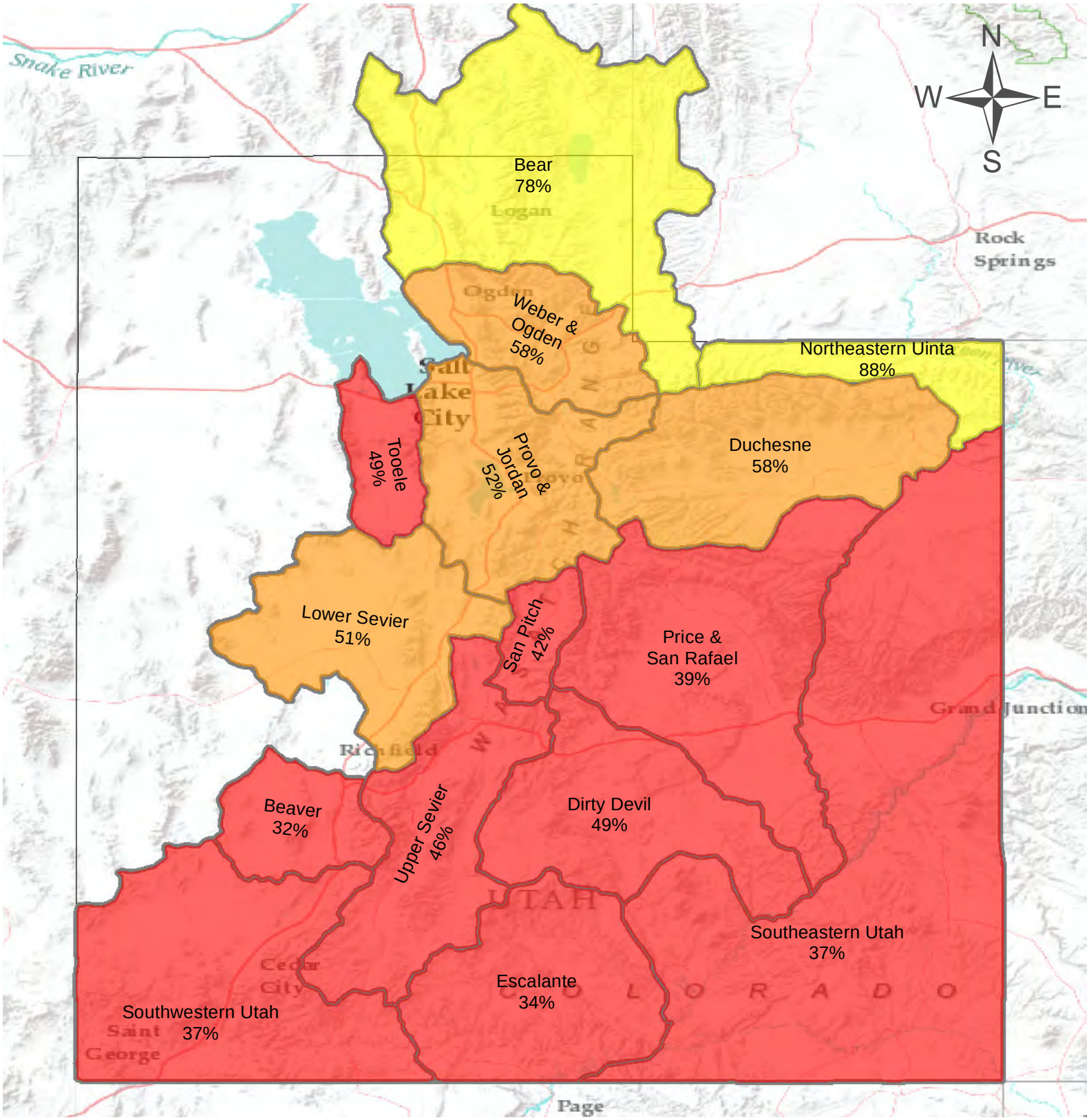
57% of Normal Precipitation

73% of Normal Precipitation Last Month

0 10 20 40 60 80 100
Miles

% of Normal

- < 50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- > 150%



Statewide Snow Water Equivalent

As of February 1, 2018:

57% of Normal Snow Water Equivalent

0 10 20 40 60 80 100 Miles

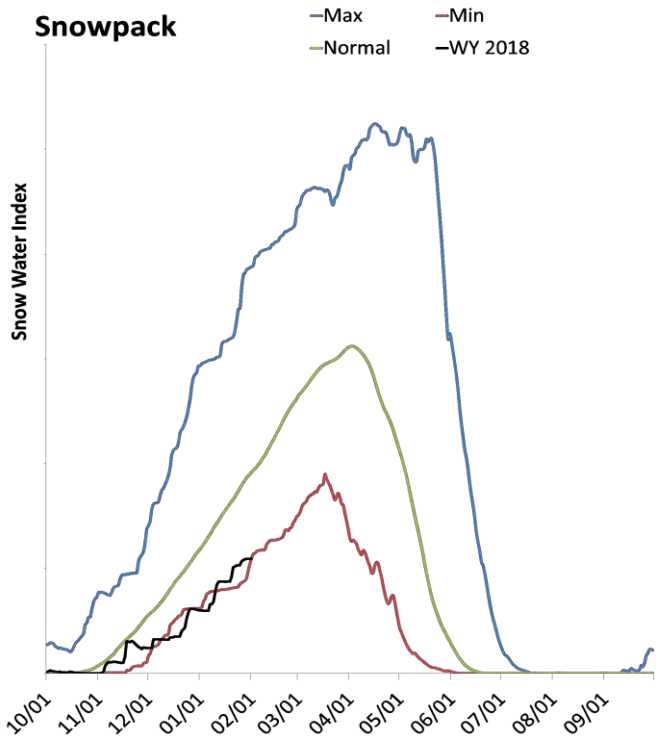
% of Normal

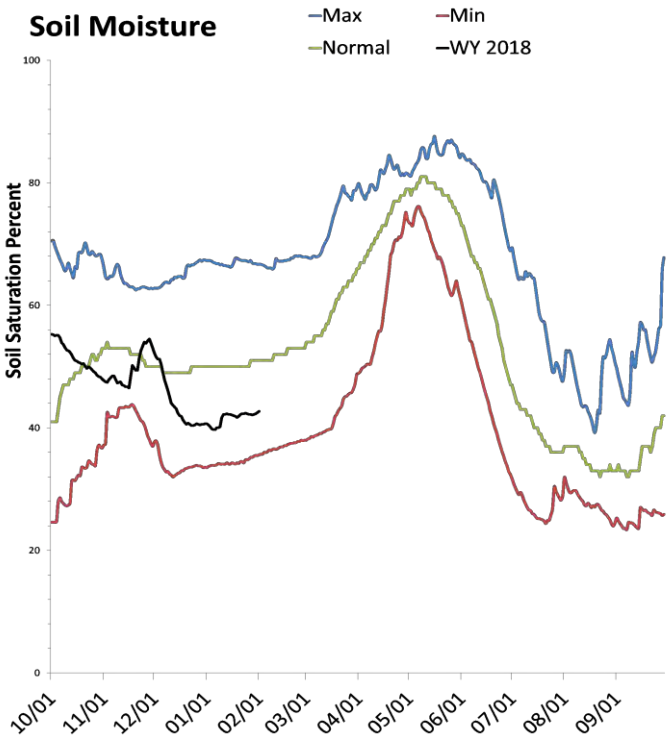
- < 50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- > 150%

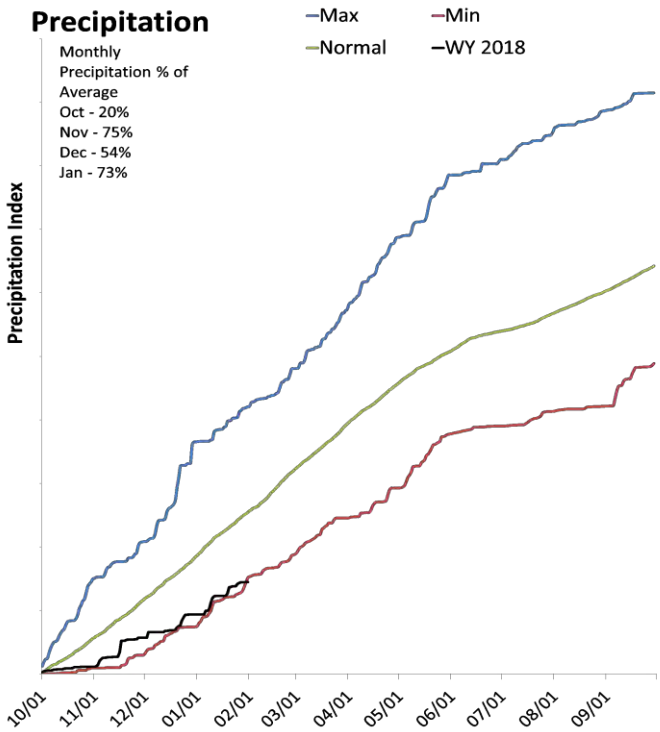
Statewide Utah

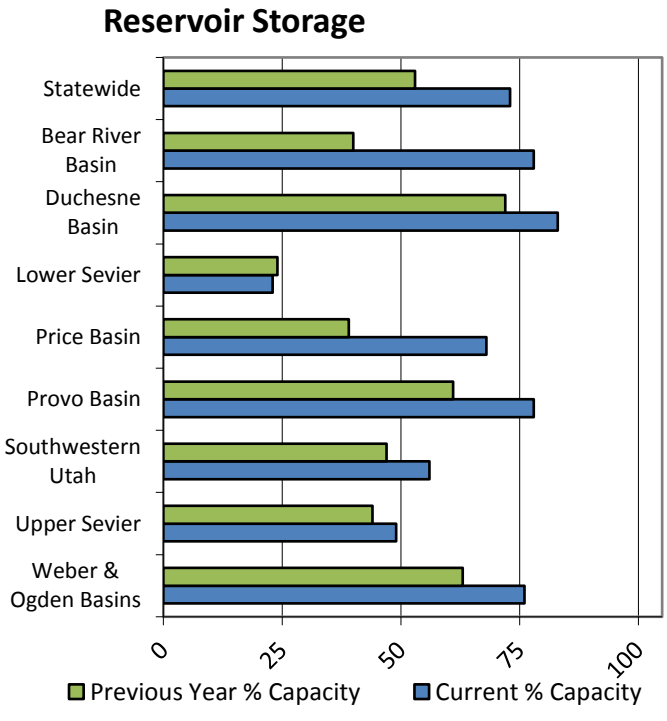
February 1, 2018

Snowpack in Utah is much below normal at 57% of normal, compared to 168% last year. Precipitation in January was below average at 73%, which brings the seasonal accumulation (Oct-Jan) to 57% of average. Soil moisture is at 42% compared to 63% last year. Reservoir storage is at 73% of capacity, compared to 53% last year. Forecast streamflow volumes range from 6% to 88% of average.







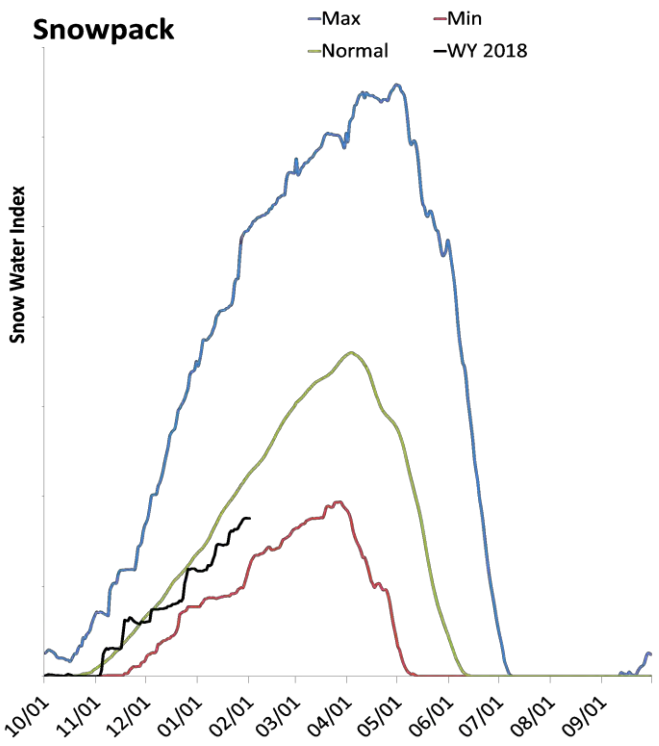


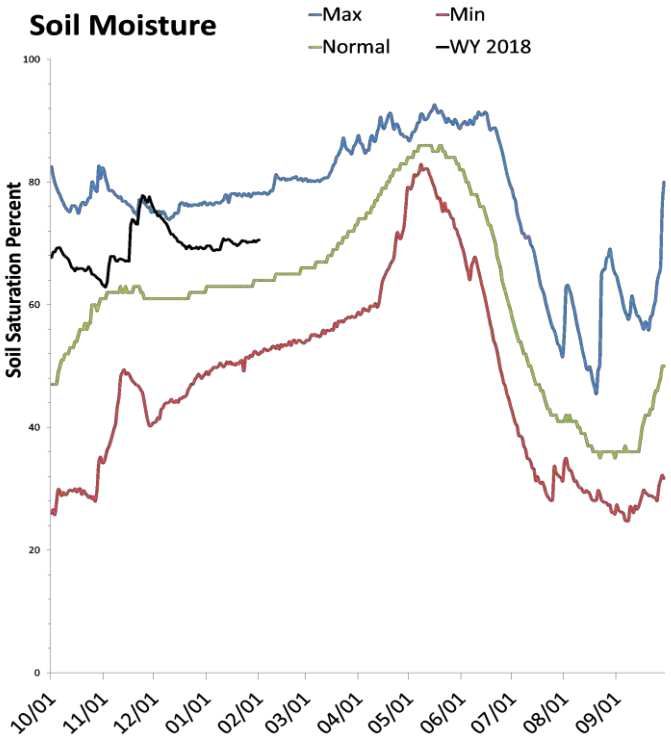
SNOTEL Data

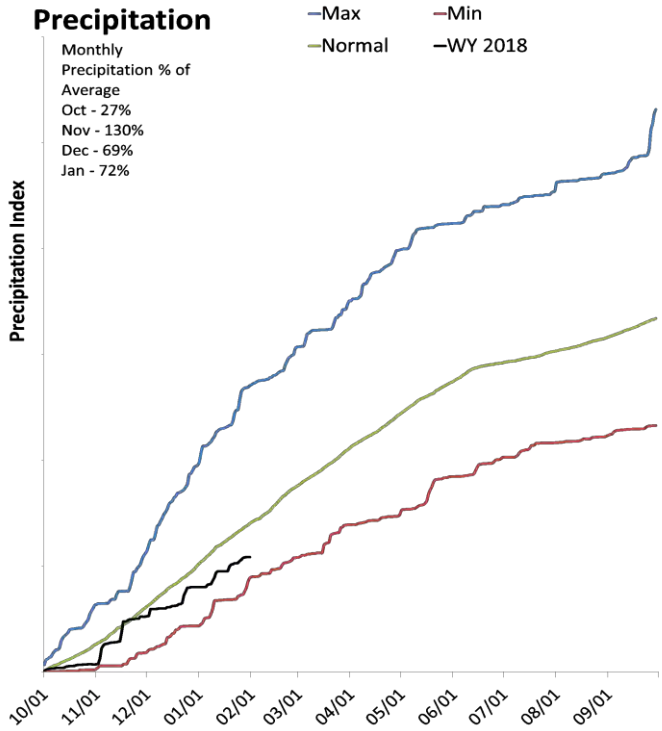
Bear River Basin

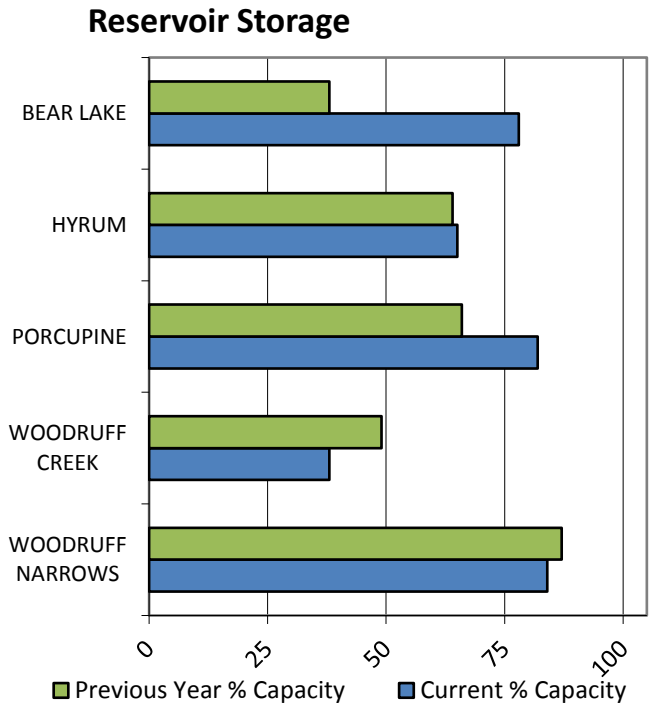
February 1, 2018

Snowpack in the Bear River Basin is below normal at 78% of normal, compared to 161% last year. Precipitation in January was below average at 72%, which brings the seasonal accumulation (Oct-Jan) to 77% of average. Soil moisture is at 71% compared to 77% last year. Reservoir storage is at 78% of capacity, compared to 40% last year. Forecast streamflow volumes range from 55% to 88% of average. The surface water supply index is 79% for the Bear River, 46% for the Woodruff Narrows, 44% for the Little Bear.









SNOTEL Data

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Bear River
Streamflow Forecasts - February 1, 2018

Bear River	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Bear R nr UT-WY State Line								
	APR-JUL	42	66	82	73%	99	123	112
	APR-SEP	47	73	91	74%	109	136	123
Bear R ab Resv nr Woodruff								
	APR-JUL	7.3	46	82	68%	118	170	121
	APR-SEP	5.1	43	82	64%	121	178	128
Big Ck nr Randolph								
	APR-JUL	0.19	0.87	2.1	55%	3.3	5.1	3.8
Smiths Fk nr Border								
	APR-JUL	49	66	78	88%	90	107	89
	APR-SEP	59	79	93	89%	107	127	104
Bear R bl Stewart Dam								
	FEB-JUL	5.5	98	160	74%	220	315	215
	FEB-SEP	7.6	110	180	75%	250	350	240
	APR-JUL	11	47	105	57%	163	250	183
	APR-SEP	6.2	55	120	59%	185	280	205
Little Bear at Paradise								
	APR-JUL	3.2	14.5	25	56%	35	51	45
Logan R nr Logan								
	APR-JUL	44	70	81	73%	104	130	111
Blacksmith Fk nr Hyrum								
	APR-JUL	7.9	21	30	70%	39	52	43

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage **End of January, 2018**	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Bear Lake	1011.7	493.6	584.8	1302.0
Hyrum Reservoir	9.9	9.8	10.2	15.3
Porcupine Reservoir	9.3	7.5	6.0	11.3
Woodruff Creek	1.5	2.0	2.4	4.0
Woodruff Narrows Reservoir	48.0	49.6	29.0	57.3
Basin-wide Total	1080.3	562.5	632.4	1389.9
# of reservoirs	5	5	5	5

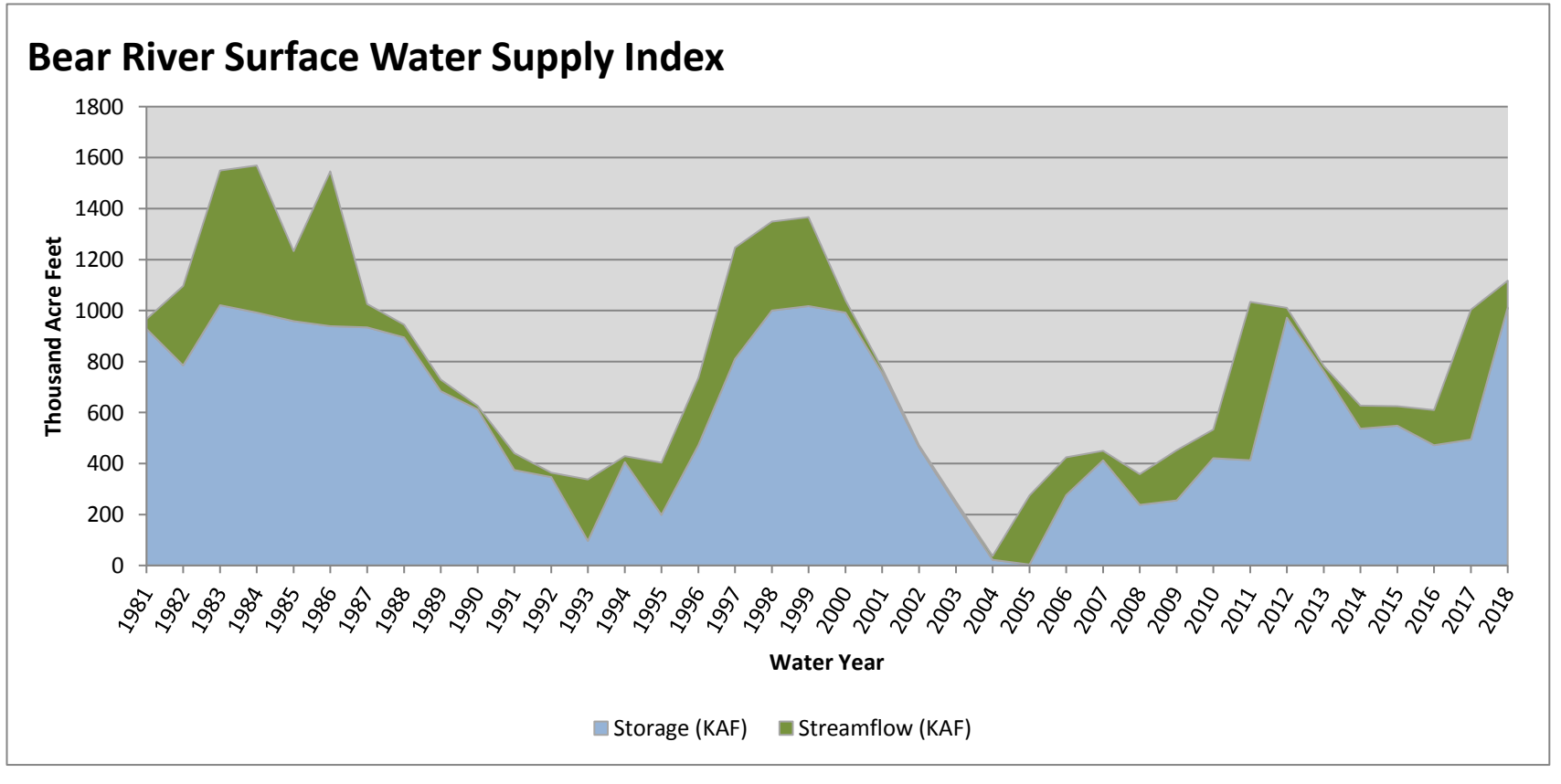
Watershed Snowpack Analysis **February 1, 2018**	# of Sites	% Median	Last Year % Median
Upper Bear	3	87%	184%
Middle Bear	7	83%	163%
Lower Bear	3	60%	150%
Logan River	7	77%	160%

February 1, 2018

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Bear River	**1011.72**	**105.00**	**1116.72**	**79**	**2.46**	**00, 82, 85, 97**

*EOM, end of month; #SWSI, Surface Water Supply Index; ^KAF, thousand acre-feet.

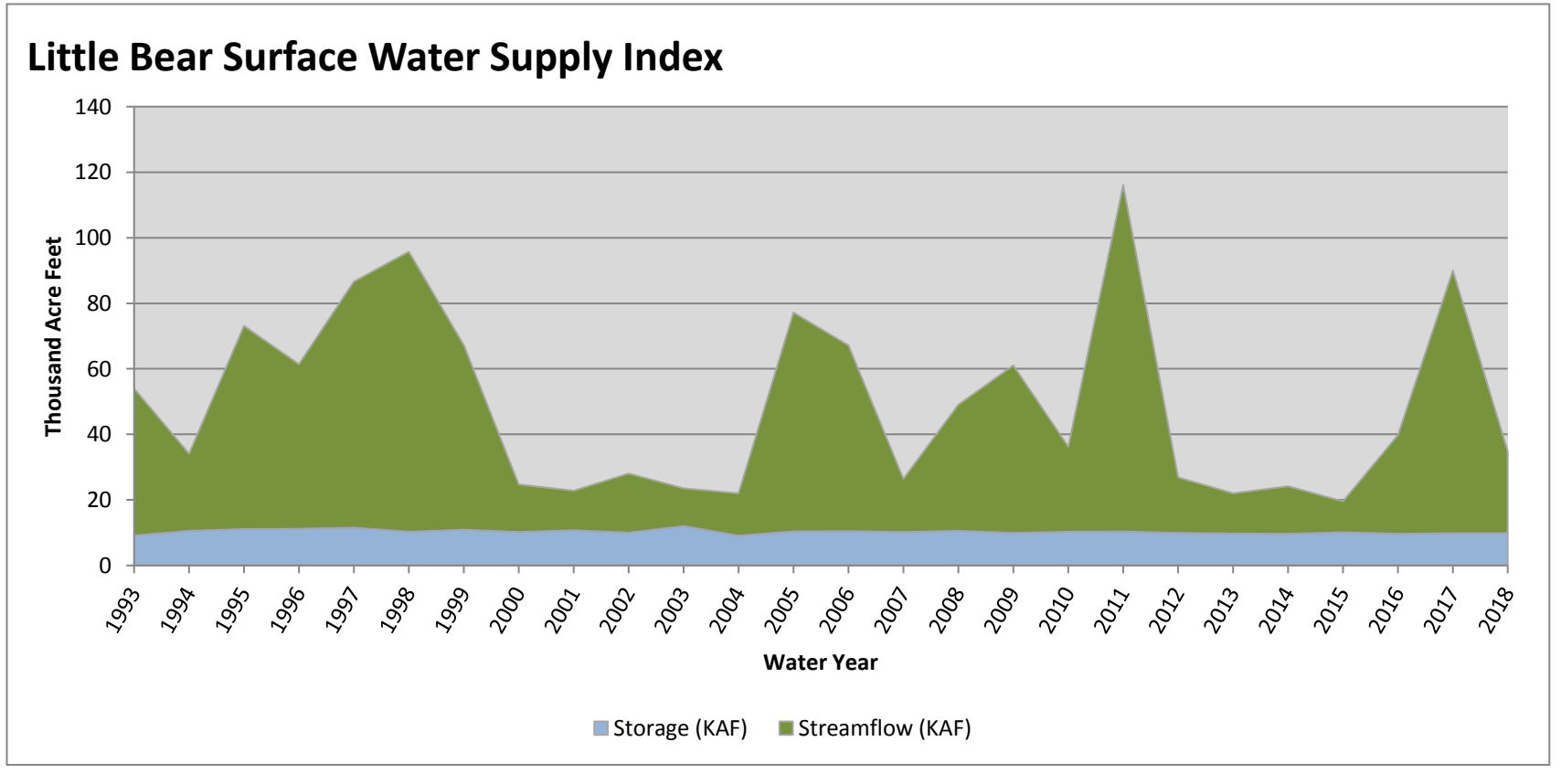


February 1, 2018

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Little Bear	**9.87**	**25.00**	**34.87**	**44**	**-0.46**	**02, 94, 10, 16**

*EOM, end of month; #SWSI, Surface Water Supply Index; ^KAF, thousand acre-feet.

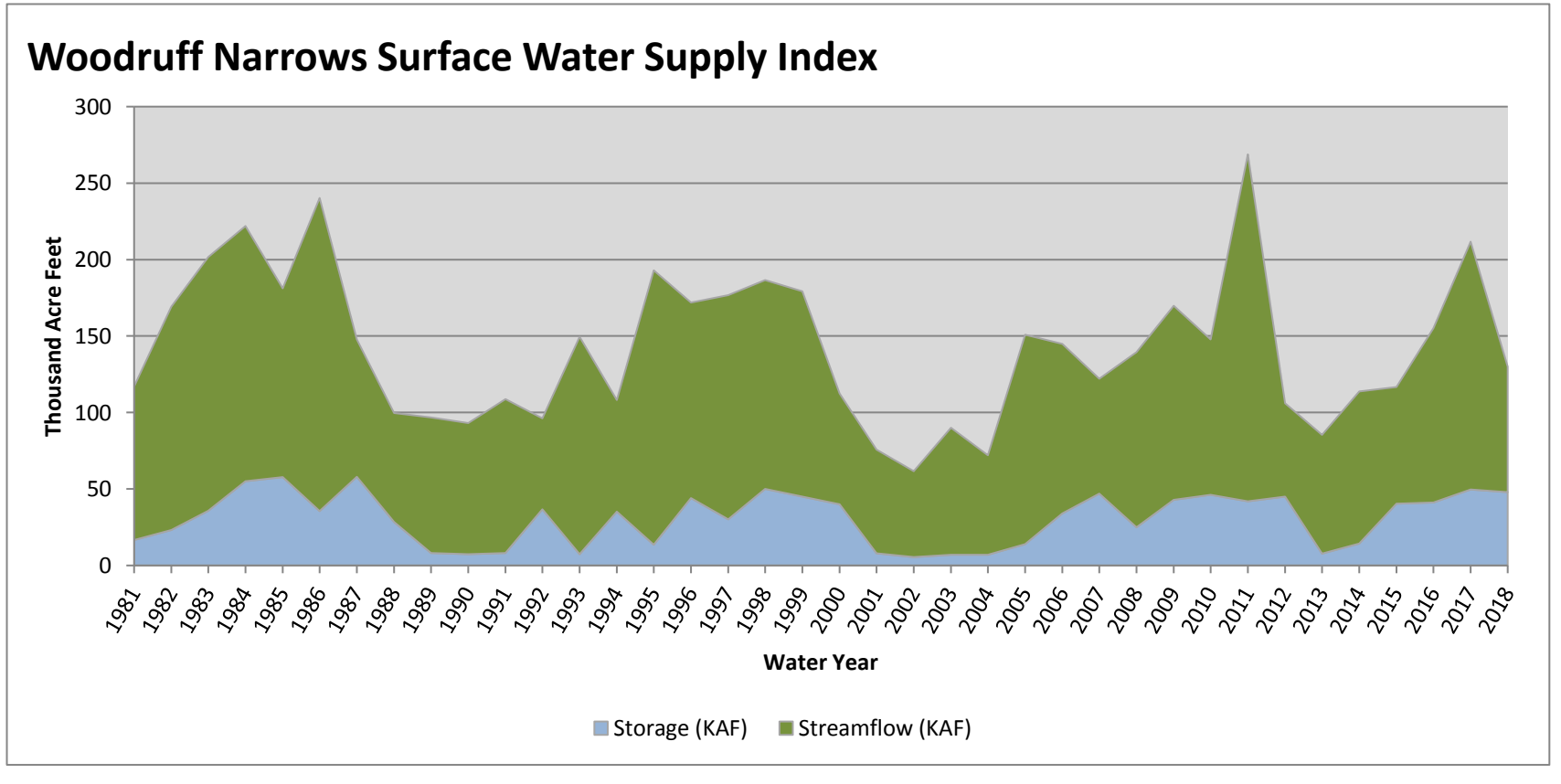


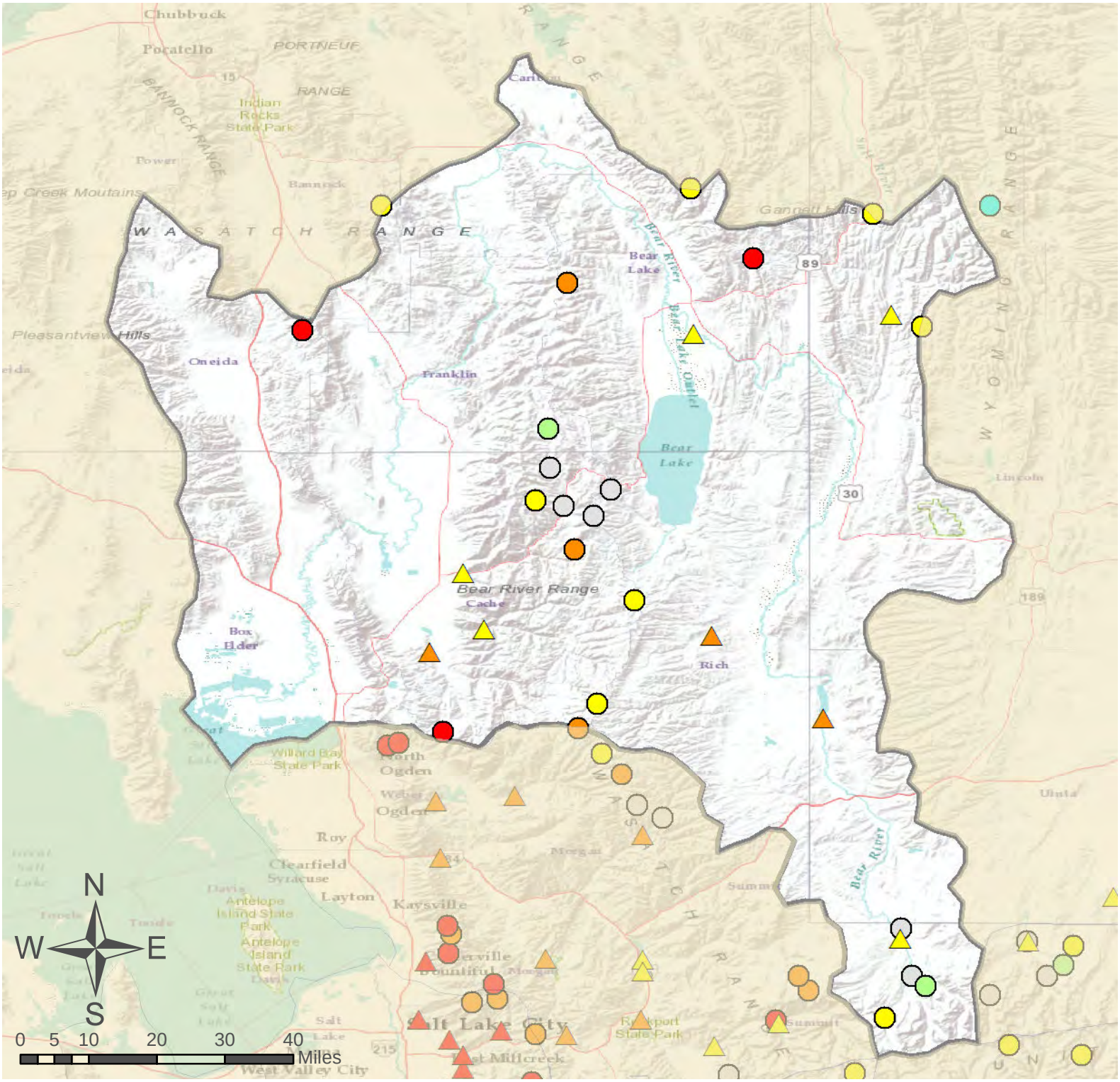
February 1, 2018

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Woodruff Narrows	**47.96**	**82.00**	**129.96**	**46**	**-0.32**	**81, 07, 08, 06**

*EOM, end of month; #SWSI, Surface Water Supply Index; ^KAF, thousand acre-feet.





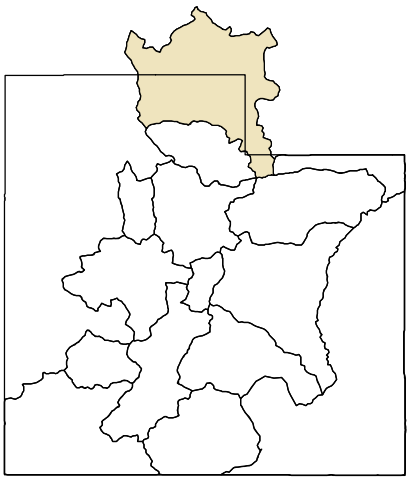
Bear River Basin

SNOTEL Site

Forecast Point

% of Normal

- < 50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- > 150%
- No Normal



As of February 1, 2018:

78% of Normal SWE

77% of Normal Precipitation

72% of Normal Precipitation Last Month

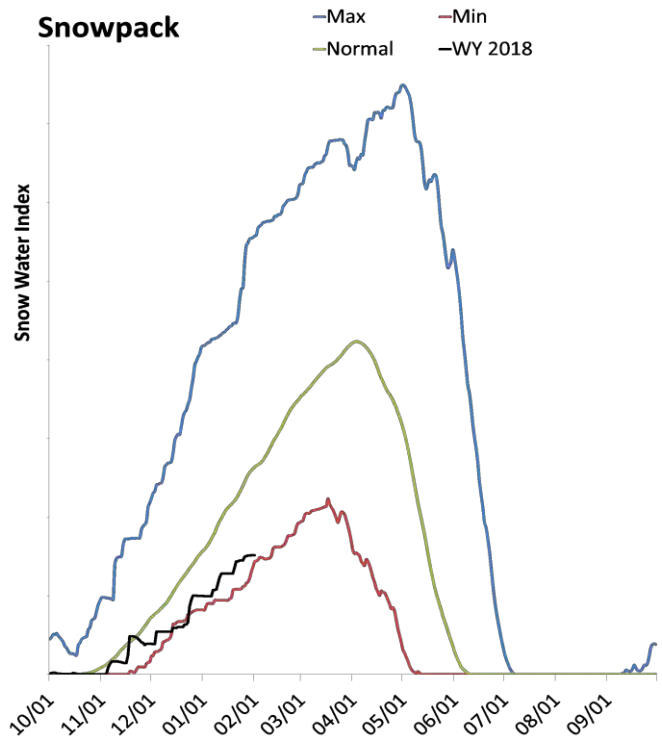
71% Saturation Soil Moisture

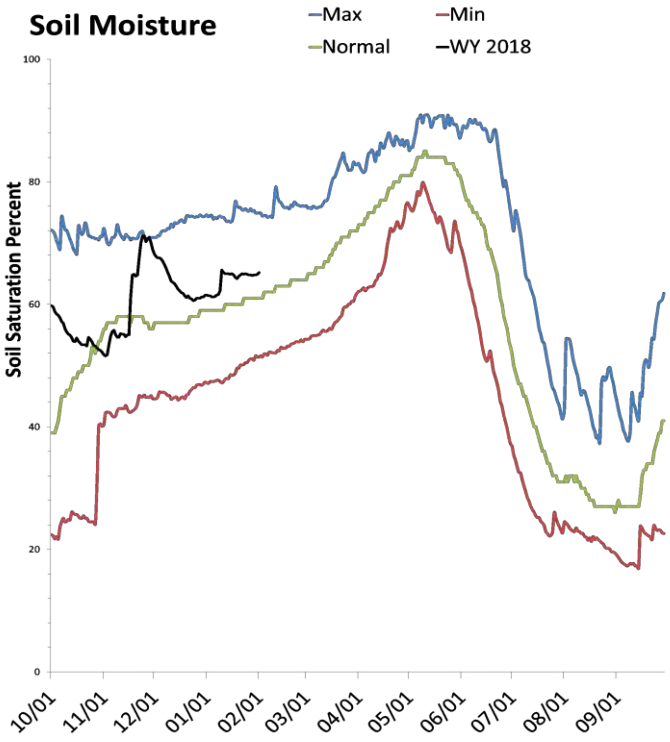
78% Reservoir Capacity

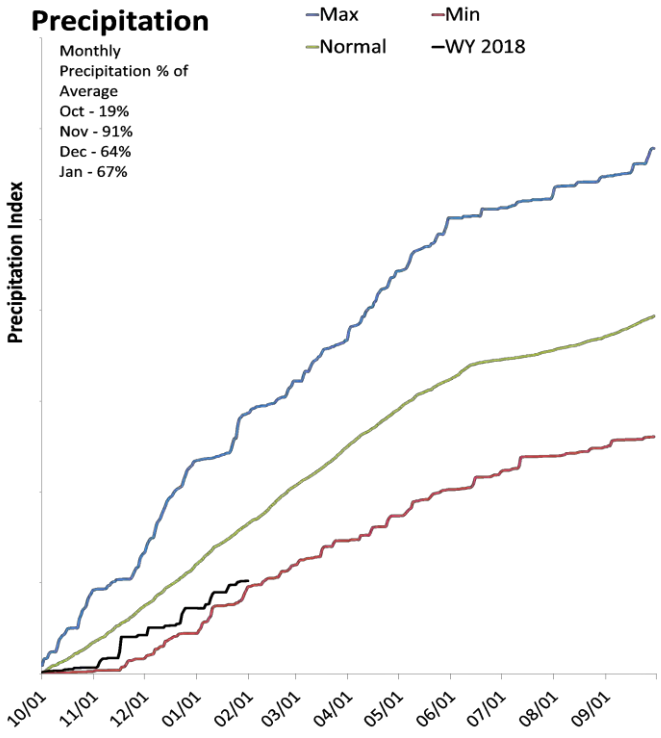
Weber & Ogden River Basins

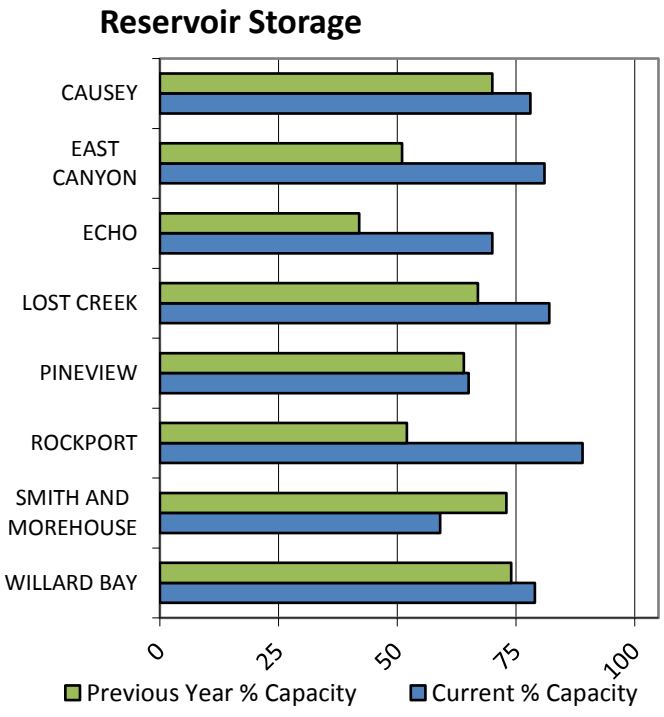
February 1, 2018

Snowpack in the Weber & Ogden River Basins is much below normal at 58% of normal, compared to 163% last year. Precipitation in January was much below average at 66%, which brings the seasonal accumulation (Oct-Jan) to 62% of average. Soil moisture is at 65% compared to 72% last year. Reservoir storage is at 76% of capacity, compared to 63% last year. Forecast streamflow volumes range from 49% to 72% of average. The surface water supply index is 54% for the Ogden River, 54% for the Weber River.









SNOTEL Data

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Weber Ogden Rivers
Streamflow Forecasts - February 1, 2018

		Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						
Weber Ogden Rivers	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Smith & Morehouse Resv Inflow	APR-JUL	15.5	21	24	71%	28	33	34
Weber R nr Oakley	APR-JUL	40	66	84	72%	102	128	117
Rockport Reservoir Inflow	APR-JUL	23	59	84	68%	109	145	123
Chalk Ck at Coalville	APR-JUL	2.1	18.1	29	71%	40	56	41
Weber R nr Coalville	APR-JUL	29	66	91	72%	116	153	126
Echo Reservoir Inflow	APR-JUL	3.6	64	105	63%	146	205	166
Lost Ck Reservoir Inflow	APR-JUL	0.97	3.4	7.3	60%	11.2	17	12.1
East Canyon Ck nr Jeremy Ranch	APR-JUL	0.61	4.5	9.1	60%	13.7	20	15.2
East Canyon Ck nr Morgan	APR-JUL	2.2	12.2	19	68%	26	36	28
Weber R at Gateway	APR-JUL	18.9	76	172	55%	265	405	315
SF Ogden R nr Huntsville	APR-JUL	2.8	17.4	31	55%	45	65	56
Pineview Reservoir Inflow	APR-JUL	2.4	43	73	62%	103	146	118
Wheeler Ck nr Huntsville	APR-JUL	0.25	1.61	3	48%	4.3	6.3	6.3
Centerville Ck	APR-JUL	0.11	0.43	0.65	48%	0.87	1.19	1.35

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of January, 2018	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Causey Reservoir	5.5	5.0	3.2	7.1
East Canyon Reservoir	39.8	25.3	34.7	49.5
Echo Reservoir	51.5	30.7	46.3	73.9
Lost Creek Reservoir	18.4	15.1	12.3	22.5
Pineview Reservoir	71.9	70.5	51.4	110.1
Rockport Reservoir	54.4	31.6	34.5	60.9
Willard Bay	169.2	159.2	133.7	215.0
Smith And Morehouse Reservoir	4.8	5.9	3.6	8.1
Basin-wide Total	415.6	343.3	319.7	547.1
# of reservoirs	8	8	8	8

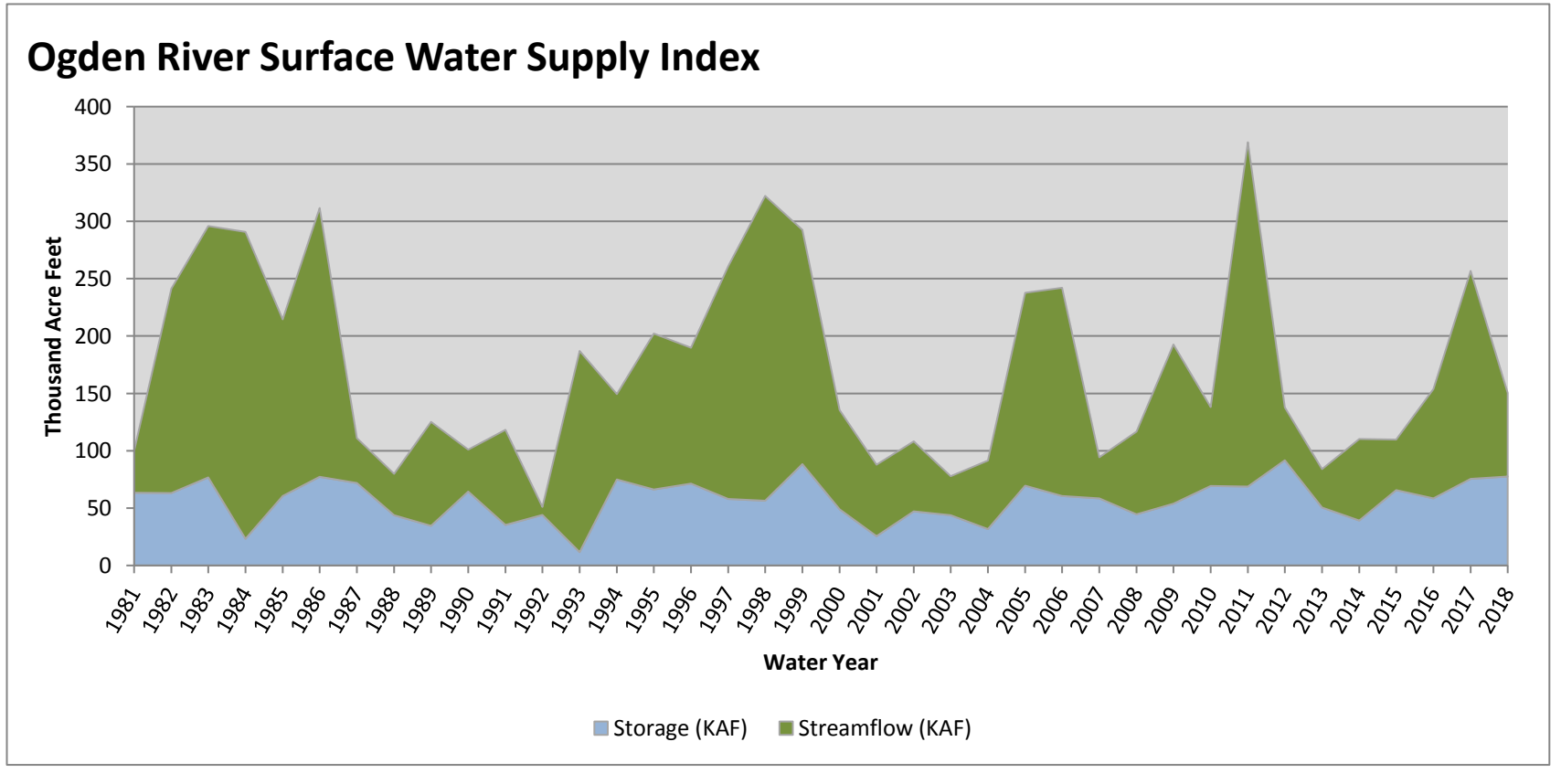
Watershed Snowpack Analysis February 1, 2018	# of Sites	% Median	Last Year % Median
Upper Weber	9	68%	169%
Lower Weber	7	53%	144%
Ogden River	5	53%	180%
Lost Creek	3	73%	162%

February 1, 2018

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Ogden River	**77.45**	**73.00**	**150.45**	**54**	**0.32**	**10, 94, 16, 93**

*EOM, end of month; #SWSI, Surface Water Supply Index; ^KAF, thousand acre-feet.

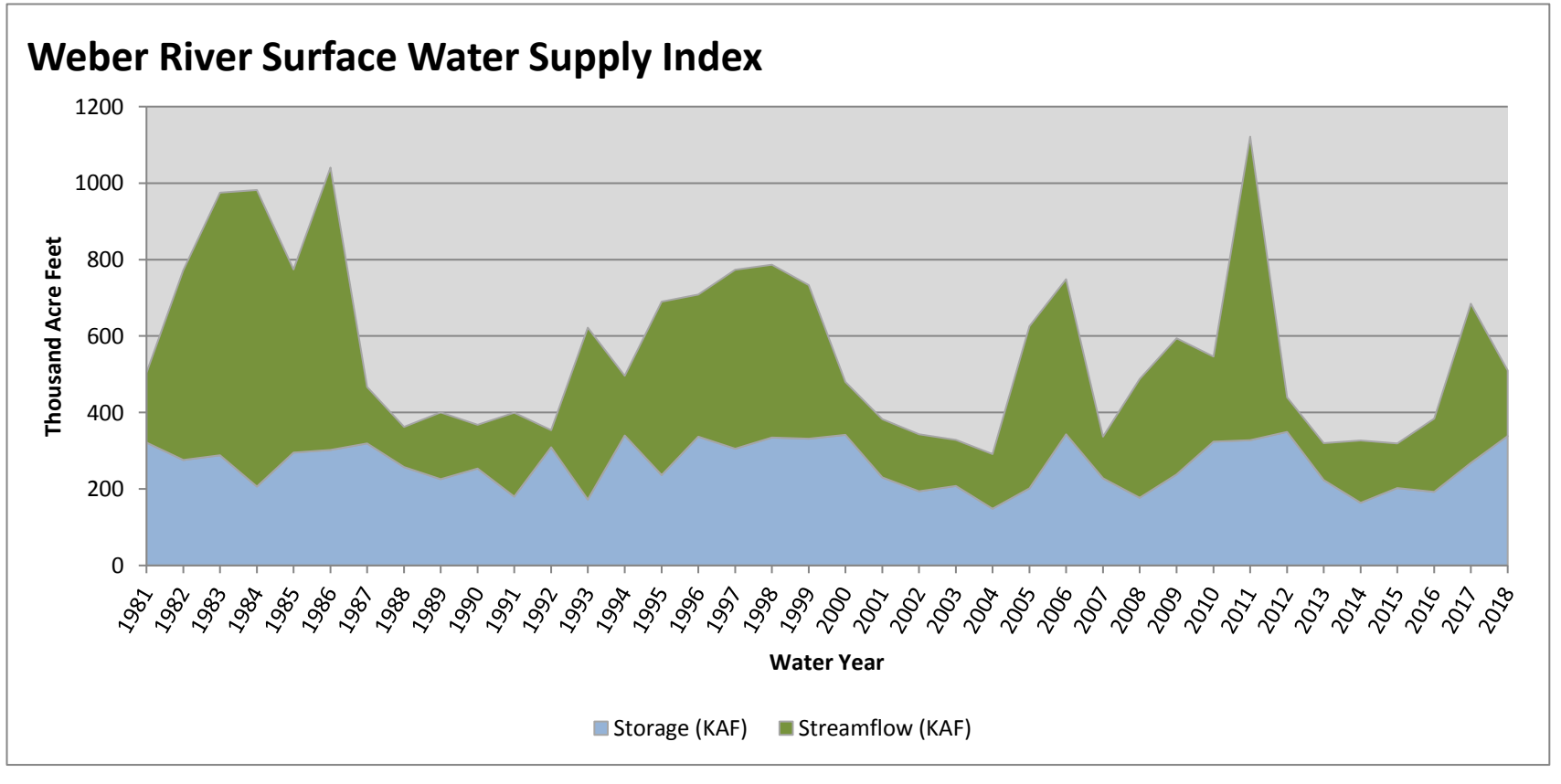


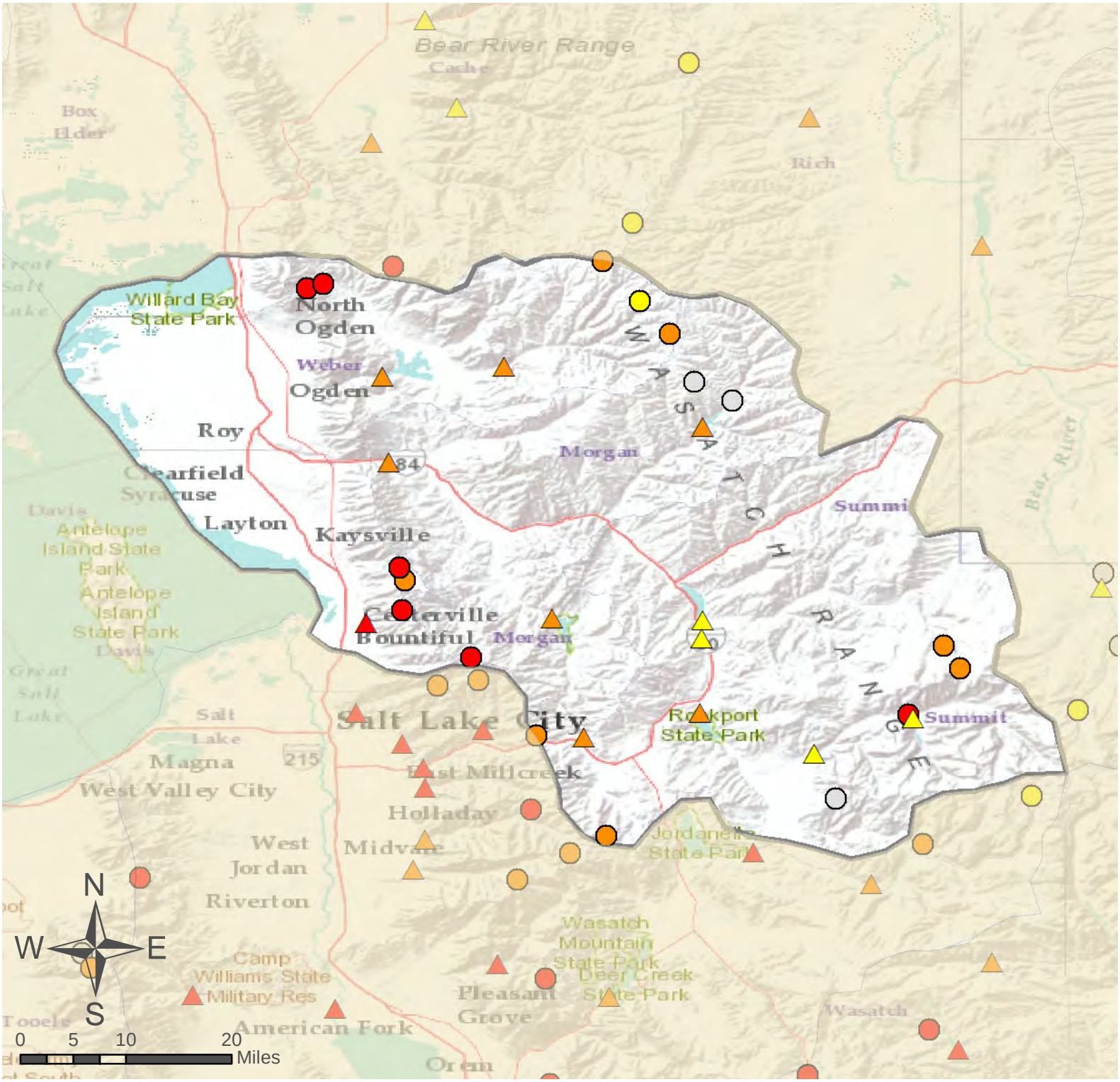
February 1, 2018

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Weber River	**338.18**	**172.00**	**510.18**	**54**	**0.32**	**94, 81, 10, 09**

*EOM, end of month; #SWSI, Surface Water Supply Index; ^KAF, thousand acre-feet.





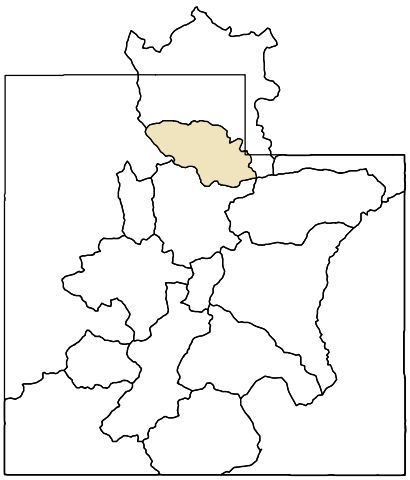
Weber & Ogden River Basins

SNOTEL Site

Forecast Point

% of Normal

- < 50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- > 150%
- No Normal



As of February 1, 2018:

58% of Normal SWE

62% of Normal Precipitation

66% of Normal Precipitation Last Month

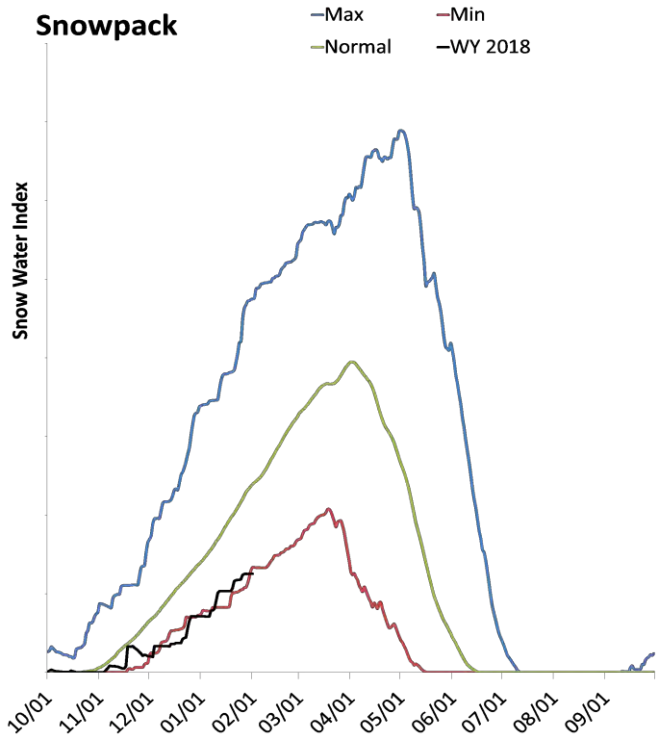
65% Saturation Soil Moisture

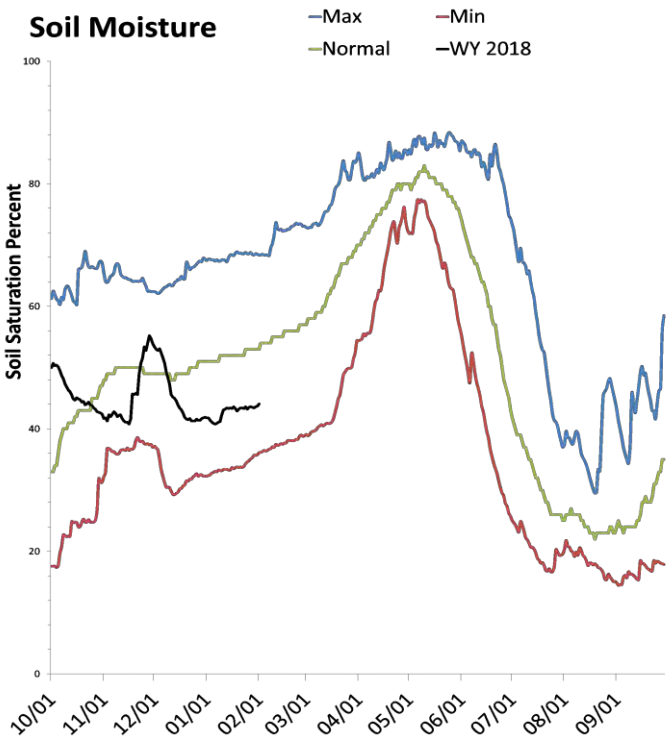
76% Reservoir Capacity

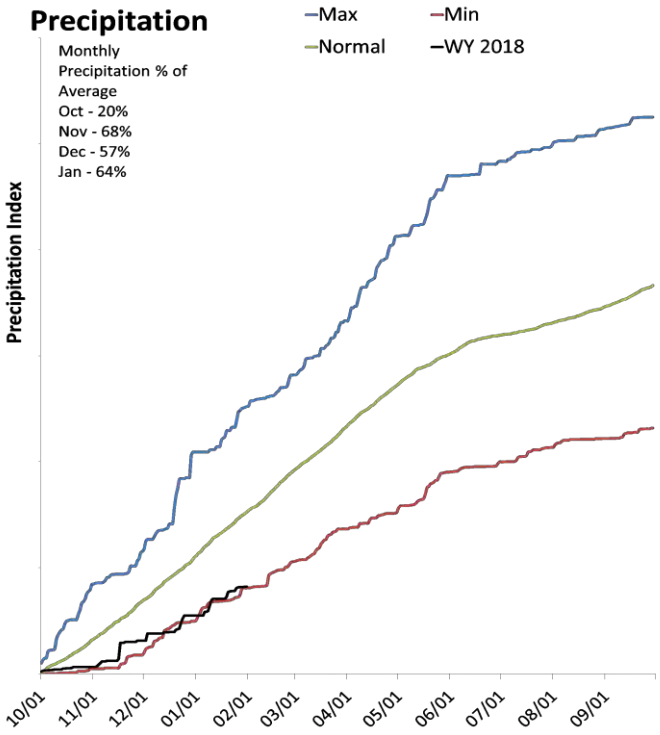
Provo & Jordan River Basins

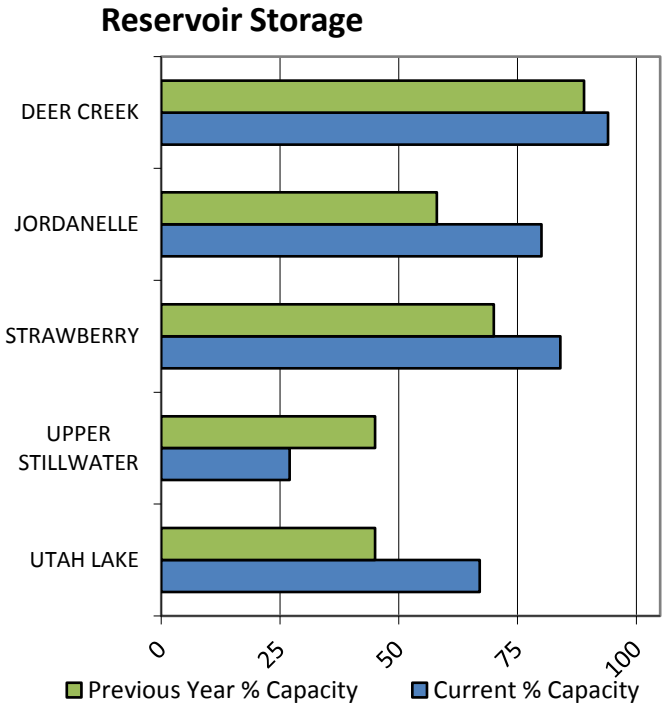
February 1, 2018

Snowpack in the Provo & Jordan River Basins is much below normal at 52% of normal, compared to 162% last year. Precipitation in January was much below average at 64%, which brings the seasonal accumulation (Oct-Jan) to 54% of average. Soil moisture is at 44% compared to 69% last year. Reservoir storage is at 78% of capacity, compared to 61% last year. Forecast streamflow volumes range from 28% to 64% of average. The surface water supply index is 40% for the Provo River.









SNOTEL Data

Data Current as of: 2/6/2018 6:47:55 AM

Provo Jordan Rivers
Streamflow Forecasts - February 1, 2018

Provo Jordan Rivers	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Provo R at Woodland	APR-JUL	24	39	52	52%	66	91	100
Provo R at Hailstone	APR-JUL	22	37	50	46%	65	90	108
Provo R bl Deer Ck Dam	APR-JUL	15.8	42	60	52%	78	104	116
Spanish Fk at Castilla	APR-JUL	5.5	25	36	52%	48	76	69
American Fk ab Upper Powerplant	APR-JUL	0.96	3.6	10	31%	16.4	25	32
Utah Lake Inflow	APR-JUL	8	50	95	36%	240	450	265
W Canyon Ck nr Cedar Fort	APR-JUL	0.04	0.18	0.5	28%	0.86	1.64	1.76
Little Cottonwood Ck nr SLC	APR-JUL	13.5	18.3	22	58%	26	33	38
Big Cottonwood Ck nr SLC	APR-JUL	10	17.7	23	64%	28	36	36
Mill Ck nr SLC	APR-JUL	0.26	1.55	3.1	48%	4.6	6.9	6.4
Parleys Ck nr SLC	APR-JUL	0.43	1.88	5.7	40%	9.5	15.2	14.2
Dell Fk nr SLC	APR-JUL	0.16	0.66	1.7	31%	3.1	5.2	5.5
Emigration Ck nr SLC	APR-JUL	0.08	0.48	1.51	38%	2.5	3.9	4
City Ck nr SLC	APR-JUL	0.39	1.93	3.4	44%	5.3	7.3	7.7
Salt Ck at Nephi	APR-JUL	0.19	0.76	1.5	16%	5.6	11.7	9.5

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of January, 2018	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Deer Creek Reservoir	140.4	133.1	107.7	149.7
Strawberry Reservoir	930.5	776.4	658.4	1105.9
Utah Lake	587.8	388.2	752.5	870.9
Jordanelle Reservoir	254.9	186.0	242.0	320.0
Basin-wide Total	1913.6	1483.8	1760.6	2446.5
# of reservoirs	4	4	4	4

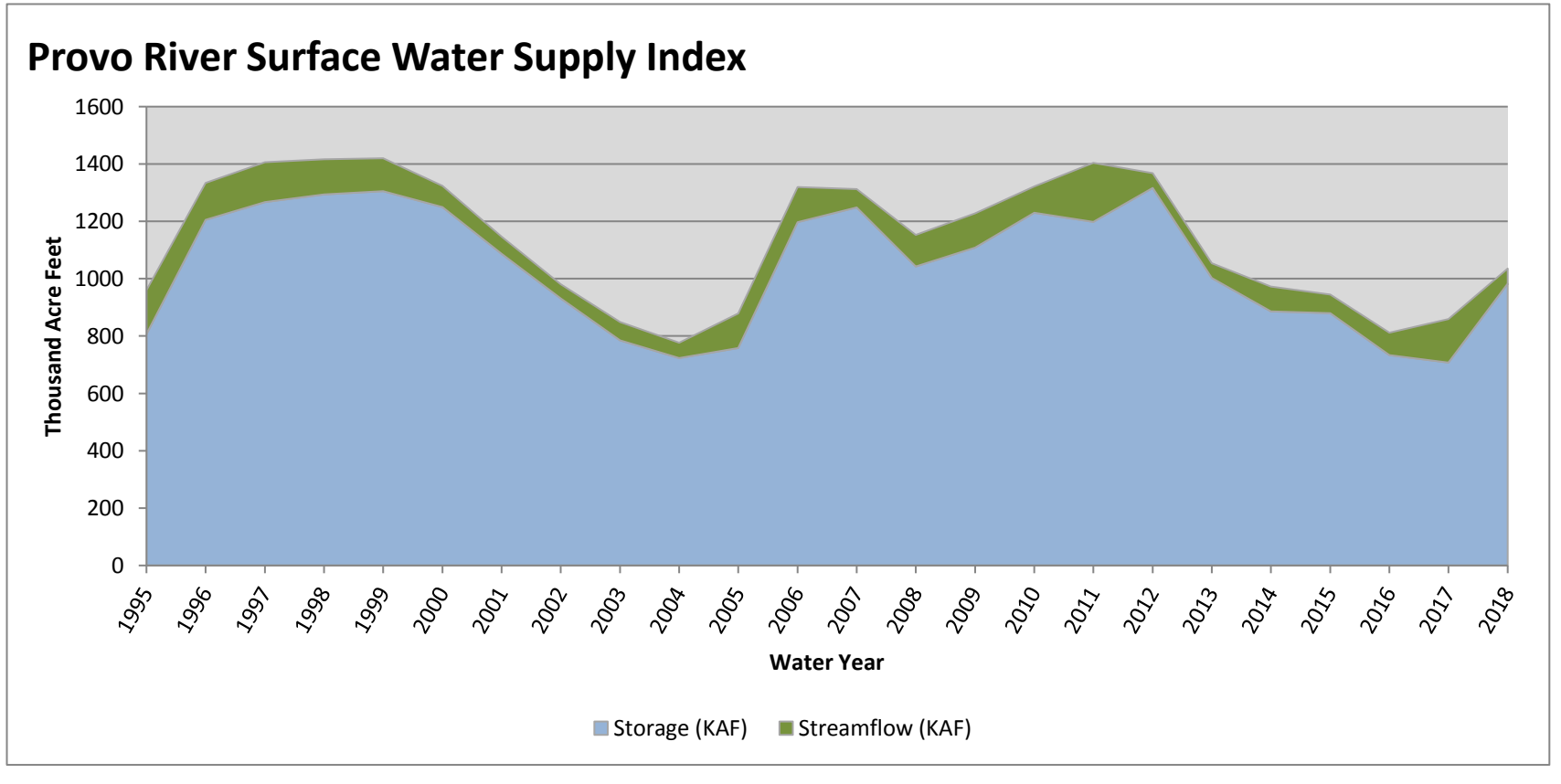
Watershed Snowpack Analysis February 1, 2018	# of Sites	% Median	Last Year % Median
Provo River	6	53%	185%
Jordan River	16	54%	143%
Utah Lake	13	50%	170%
Spanish Fork River	5	42%	173%
Six Creeks	15	54%	143%
Cottonwood Creeks	7	54%	148%

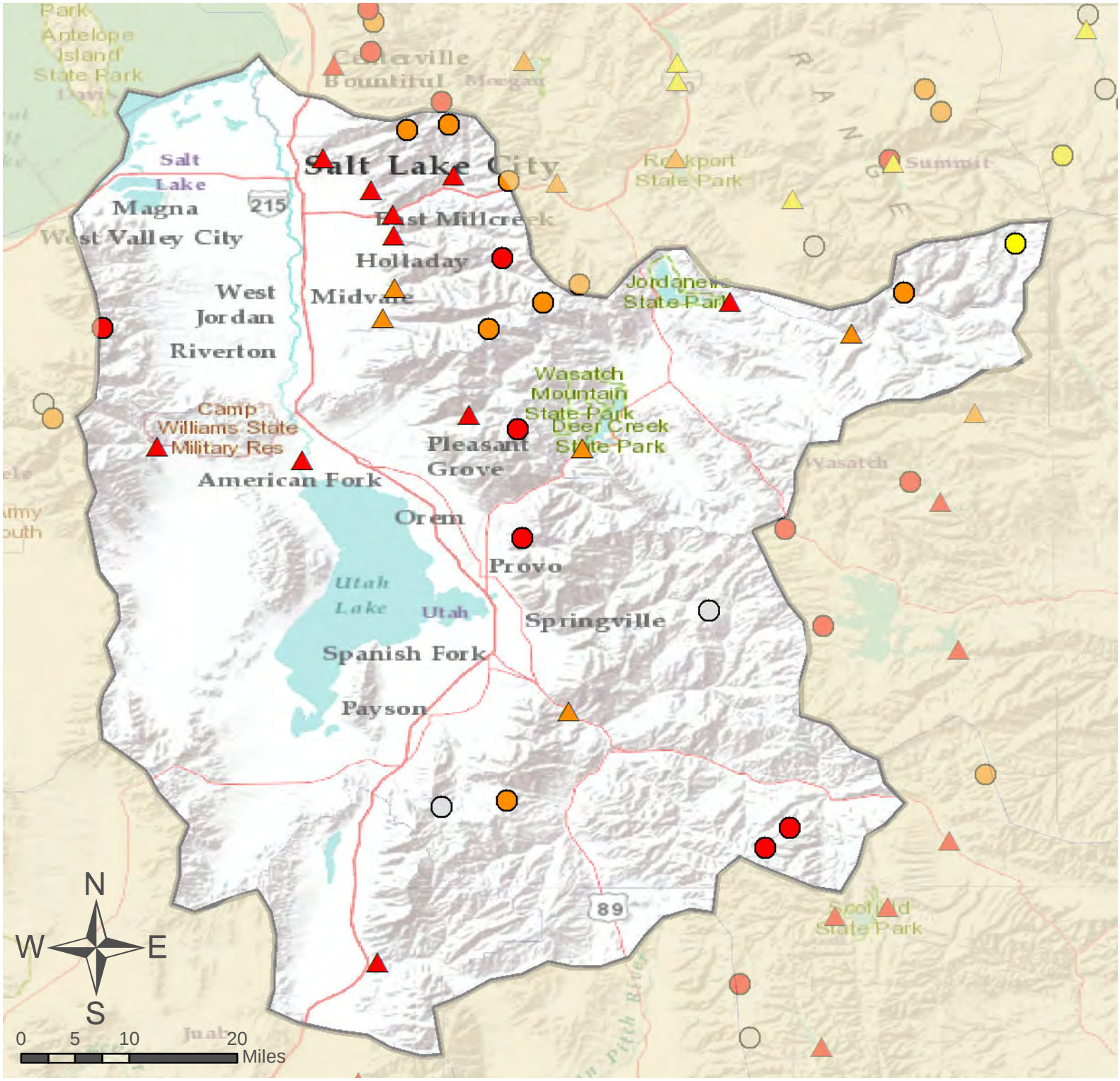
February 1, 2018

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Provo River	**983.07**	**52.00**	**1035.07**	**40**	**-0.83**	**14, 02, 13, 01**

*EOM, end of month; #SWSI, Surface Water Supply Index; ^KAF, thousand acre-feet.





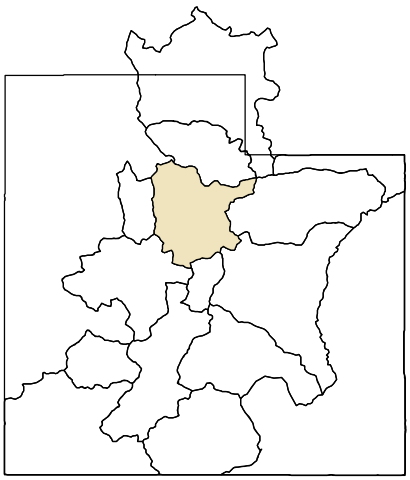
Provo & Jordan River Basins

SNOTEL Site

Forecast Point

% of Normal

- < 50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- > 150%
- No Normal



As of February 1, 2018:

52% of Normal SWE

54% of Normal Precipitation

64% of Normal Precipitation Last Month

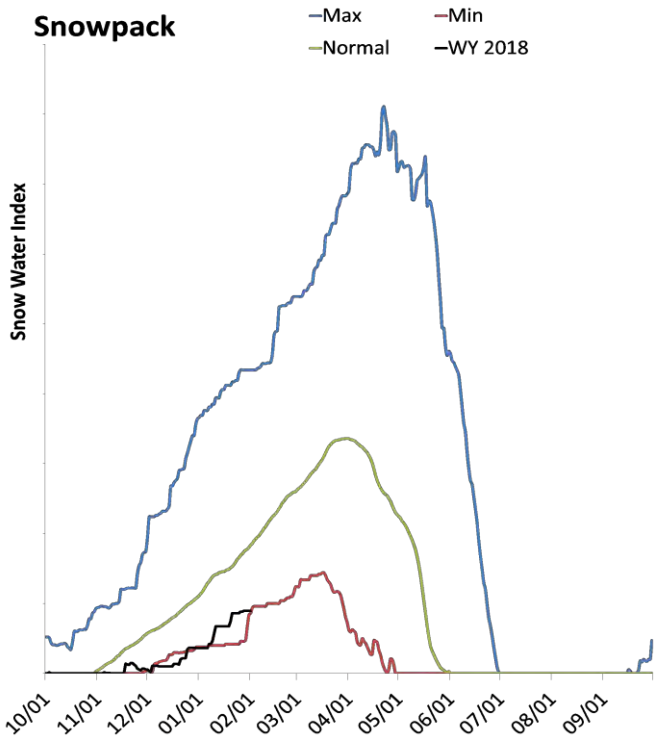
44% Saturation Soil Moisture

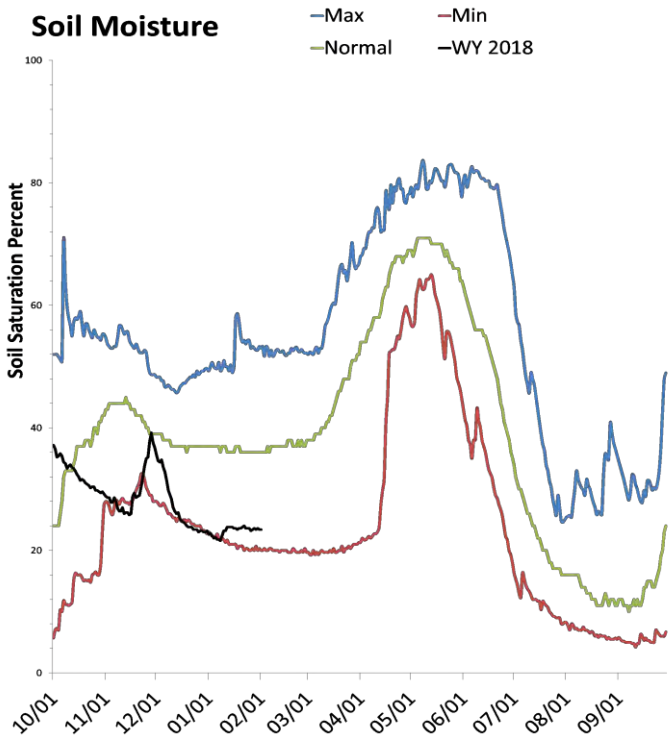
78% Reservoir Capacity

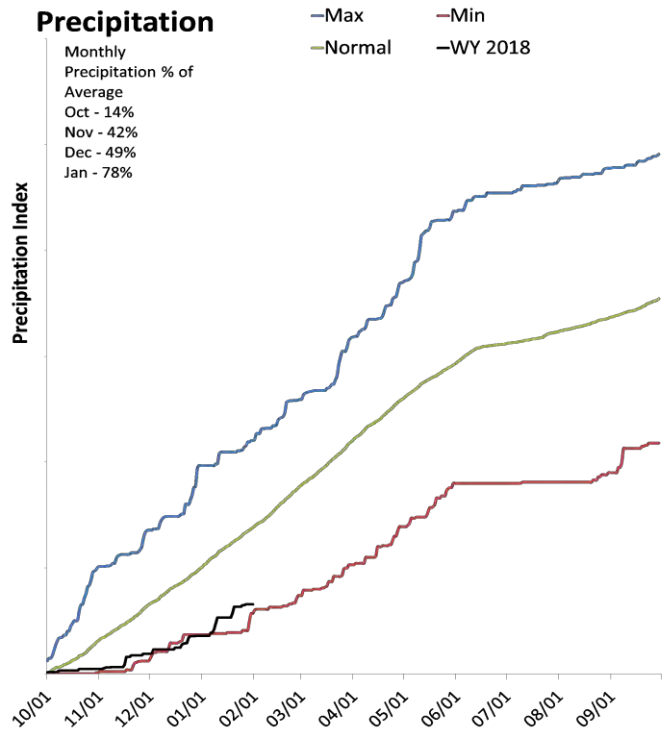
Tooele Valley & West Desert Basins

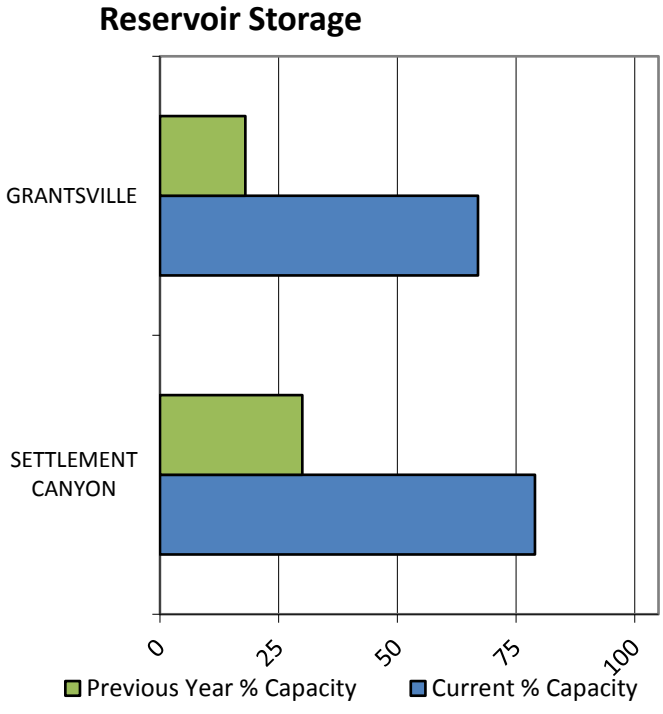
February 1, 2018

Snowpack in the Tooele Valley & West Desert Basins is much below normal at 49% of normal, compared to 173% last year. Precipitation in January was below average at 80%, which brings the seasonal accumulation (Oct-Jan) to 48% of average. Soil moisture is at 23% compared to 47% last year. Reservoir storage is at 70% of capacity, compared to 21% last year. Forecast streamflow volumes range from 22% to 59% of average.









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Tooele Valley West Desert
Streamflow Forecasts - February 1, 2018

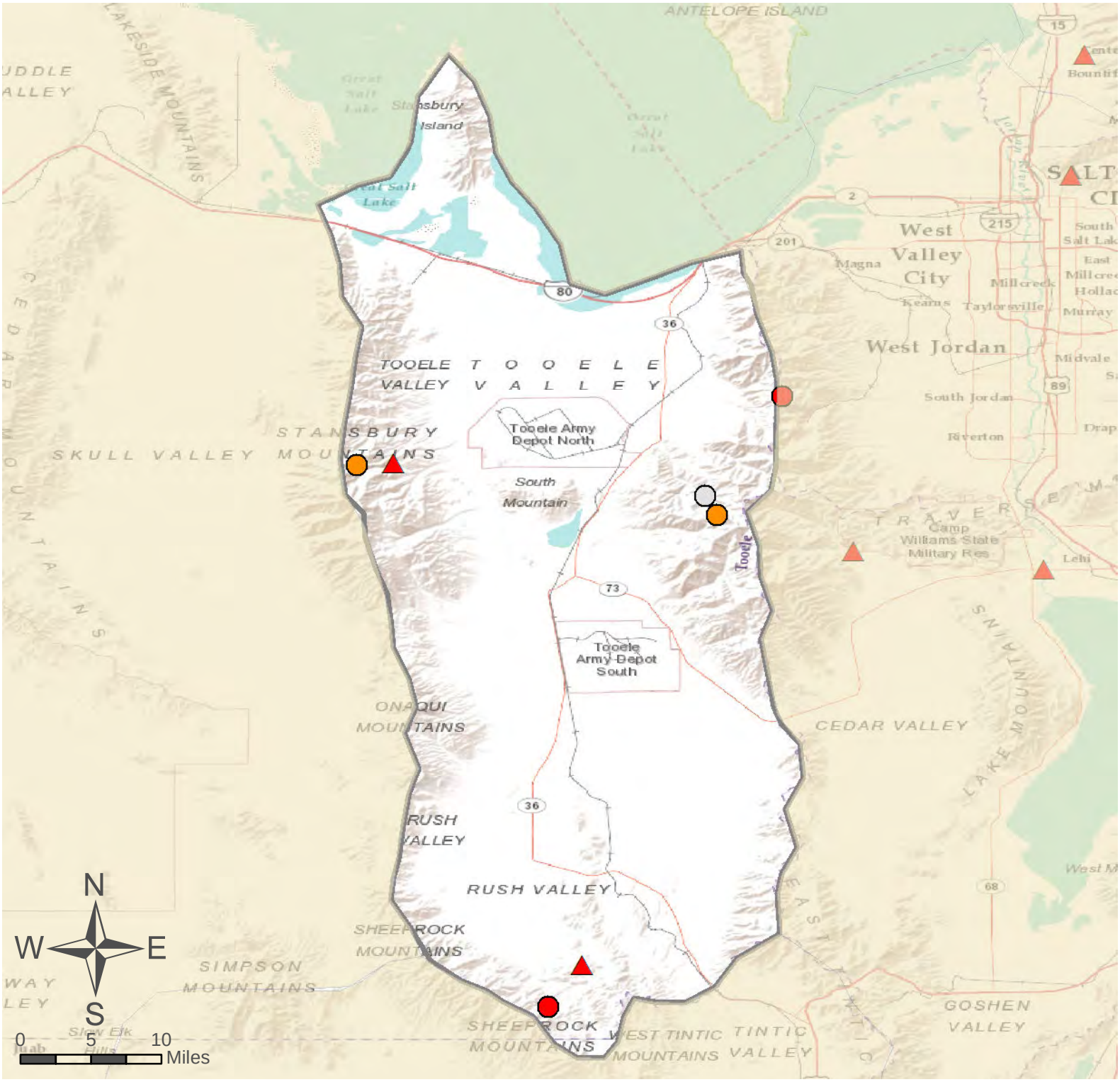
Forecast Exceedance Probabilities for Risk Assessment
Chance that actual volume will exceed forecast

Tooele Valley West Desert	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Vernon Ck nr Vernon	APR-JUL	0.04	0.18	0.3	22%	0.65	1.29	1.39
S Willow Ck nr Grantsville	APR-JUL	0.06	0.26	1	32%	1.74	2.8	3.1
Dunn Ck nr Park Valley	APR-JUL	0.14	1.01	1.7	59%	2.4	3.4	2.9
W Canyon Ck nr Cedar Fort	APR-JUL	0.04	0.18	0.5	28%	0.86	1.64	1.76

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of January, 2018	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Settlement Canyon Reservoir	0.8	0.3	0.7	1.0
Grantsville Reservoir	2.2	0.6	1.8	3.3
Basin-wide Total	3.0	0.9	2.5	4.3
# of reservoirs	2	2	2	2

Watershed Snowpack Analysis February 1, 2018	# of Sites	% Median	Last Year % Median
Tooele Valley	3	50%	159%
Raft River	1	85%	165%
Deep Creek	0		
Northwestern Utah	2	49%	180%



Tooele Valley & West Desert Basins

SNOTEL Site

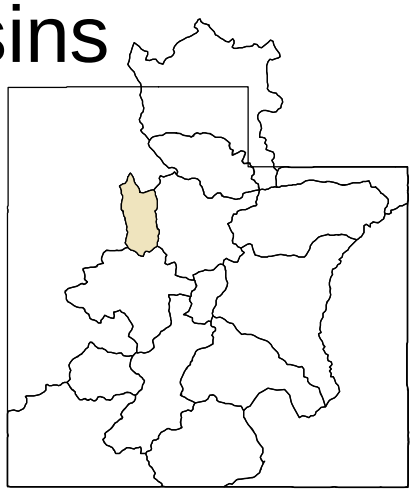
Forecast Point

As of February 1, 2018:

- 49% of Normal SWE
- 48% of Normal Precipitation
- 80% of Normal Precipitation Last Month
- 23% Saturation Soil Moisture
- 70% Reservoir Capacity

% of Normal

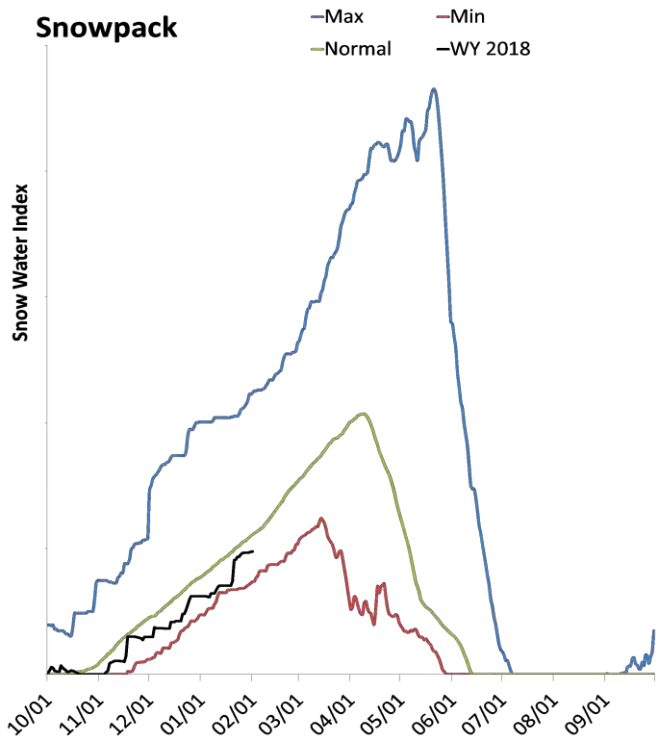
- < 50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- > 150%
- No Normal

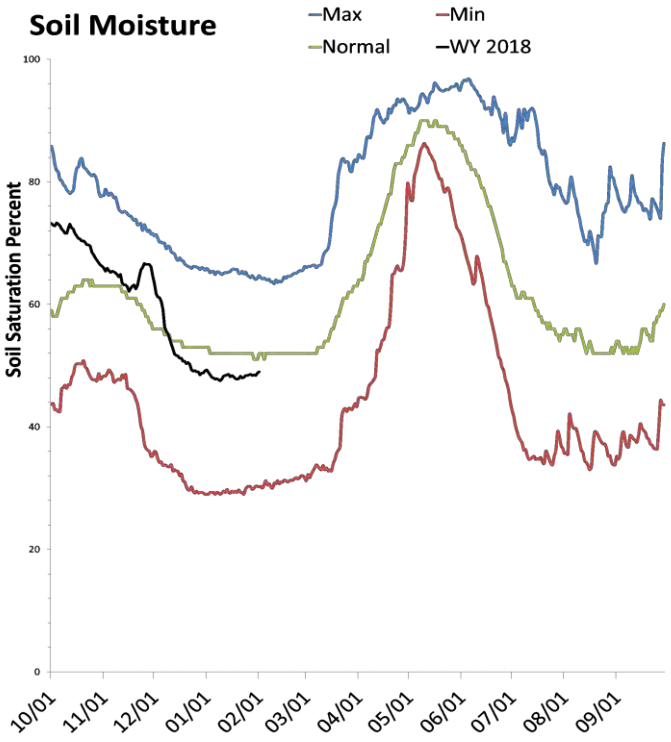


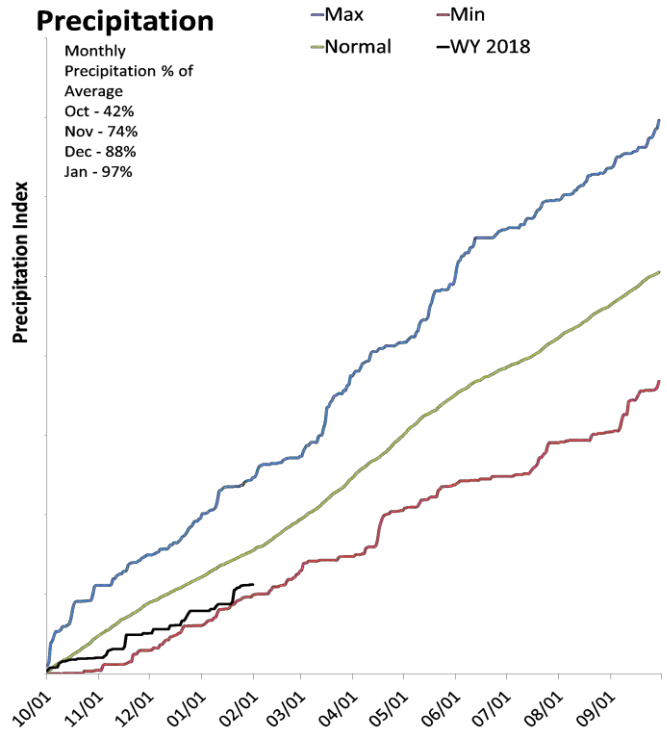
Northeastern Uinta Basin

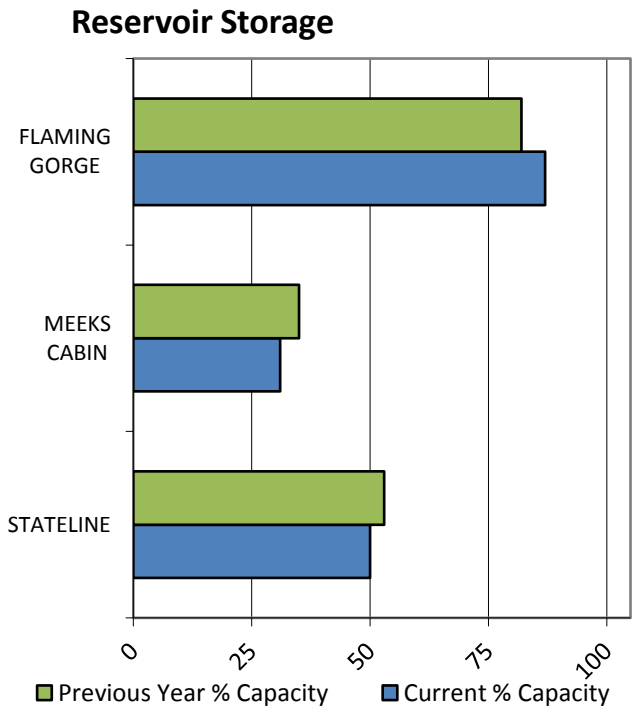
February 1, 2018

Snowpack in the Northeastern Uinta Basin is below normal at 88% of normal, compared to 145% last year. Precipitation in January was near average at 100%, which brings the seasonal accumulation (Oct-Jan) to 73% of average. Soil moisture is at 47% compared to 62% last year. Reservoir storage is at 86% of capacity, compared to 82% last year. Forecast streamflow volumes range from 60% to 86% of average. The surface water supply index is 36% for the Blacks Fork, 36% for the Smiths Creek.









SNOTEL Data

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Northeastern Uintas
Streamflow Forecasts - February 1, 2018

Northeastern Uintas	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
		Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						
Blacks Fk nr Robertson	APR-JUL	42	60	72	84%	84	102	86
EF of Smiths Fork nr Robertson [2]	APR-JUL	12.8	18.3	22	81%	26	31	27
Flaming Gorge Reservoir Inflow [2]	APR-JUL	280	610	840	86%	1060	1400	980
Ashley Ck nr Vernal	APR-JUL	14.1	23	30	60%	38	52	50
Big Brush Ck ab Red Fleet Reservoir	APR-JUL	8	10.3	14	67%	17.7	23	21

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of January, 2018	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Flaming Gorge Reservoir	3259.2	3087.3	3049.0	3749.0
Stateline Reservoir	6.0	6.4	5.4	12.0
Meeks Cabin Reservoir	10.0	11.2	11.9	32.5
Basin-wide Total	3275.3	3104.9	3066.3	3793.5
# of reservoirs	3	3	3	3

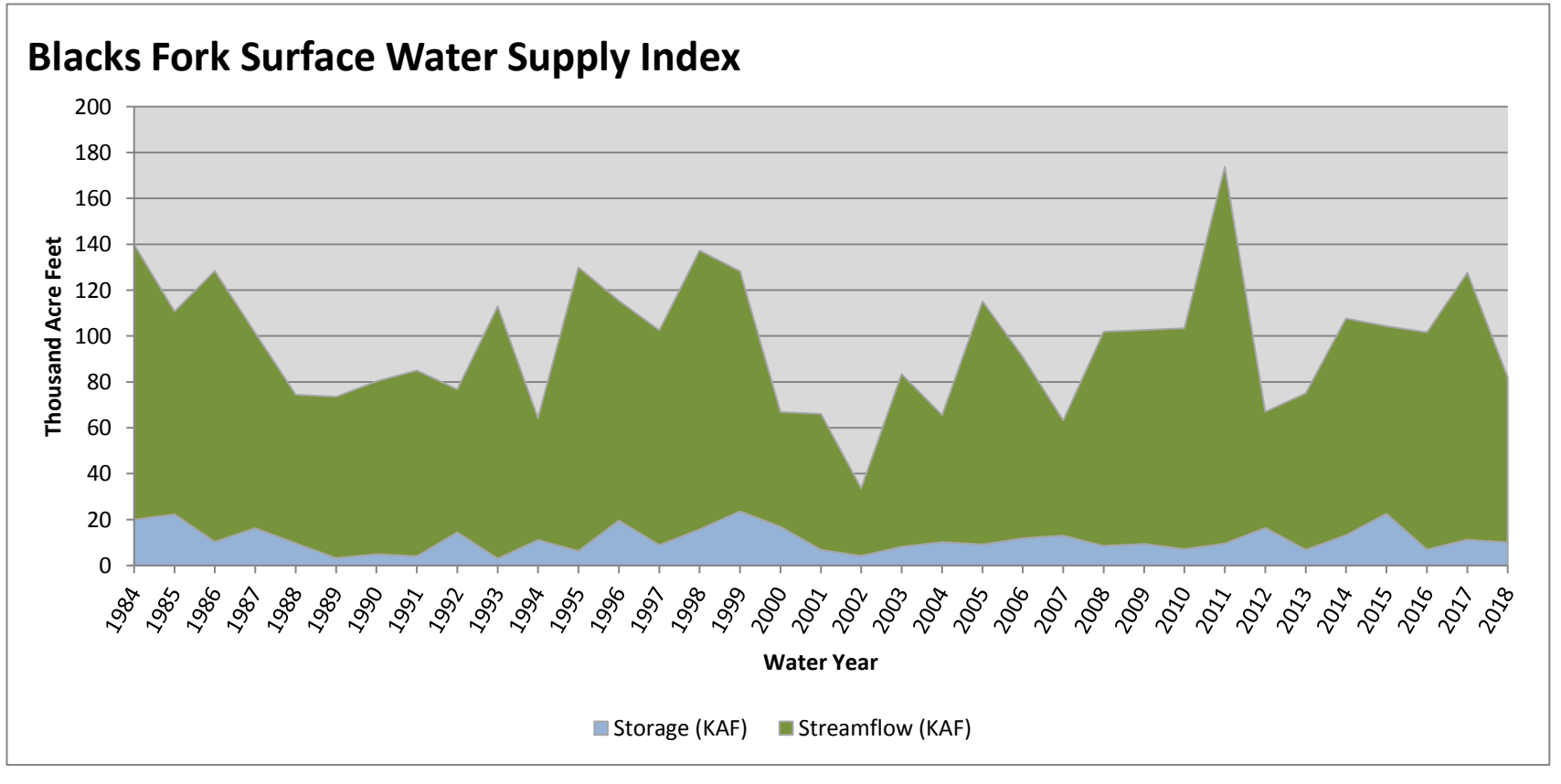
Watershed Snowpack Analysis February 1, 2018	# of Sites	% Median	Last Year % Median
Blacks Fork River	3	86%	162%
Upper Green	2	109%	144%
Ashley Brush Creeks	4	57%	162%

February 1, 2018

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Blacks Fork	**10.02**	**72.00**	**82.02**	**36**	**-1.16**	**92, 90, 03, 91**

*EOM, end of month; #SWSI, Surface Water Supply Index; ^KAF, thousand acre-feet.

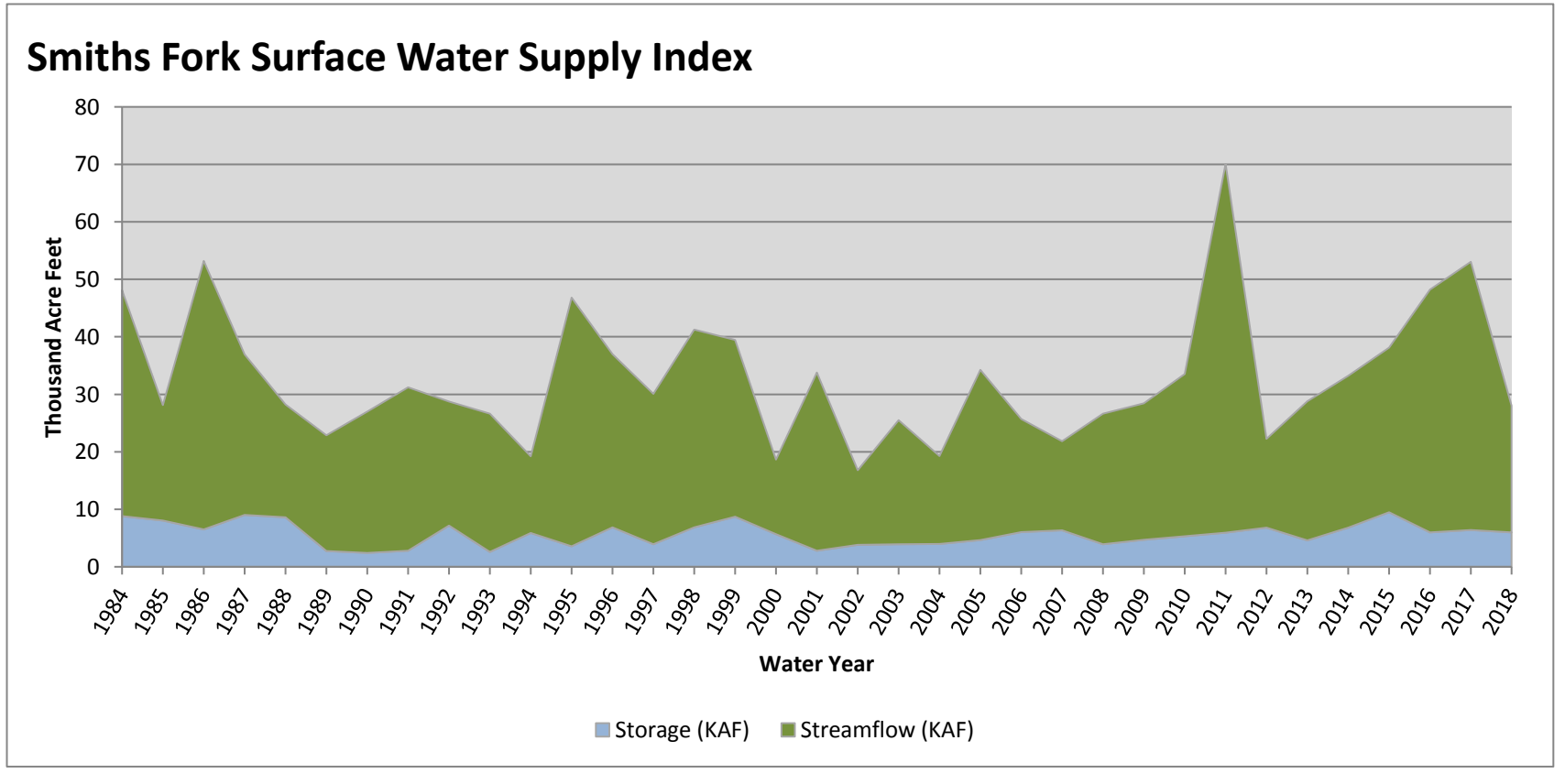


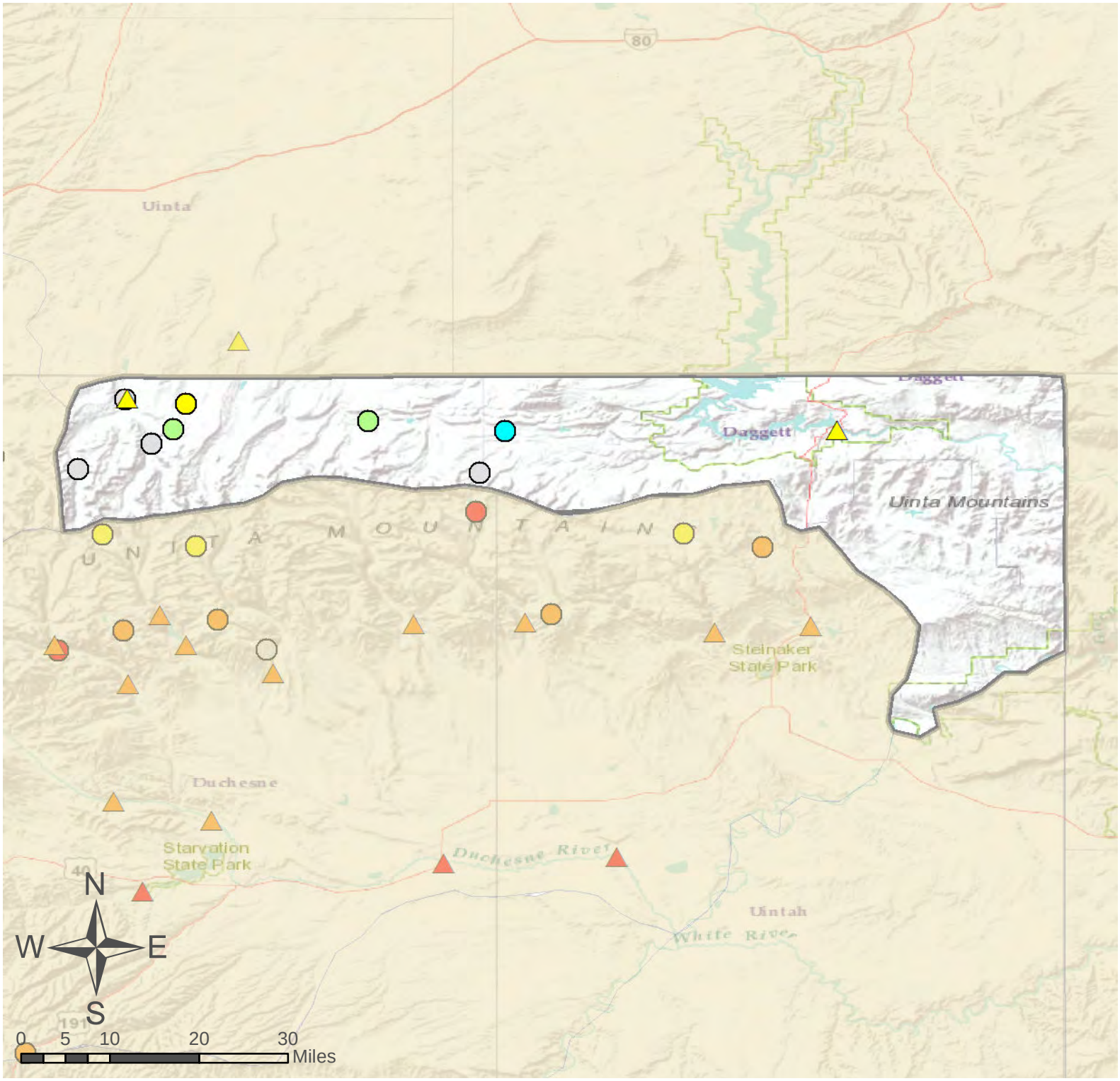
February 1, 2018

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Smiths Fork	**6.00**	**22.00**	**28.00**	**36**	**-1.16**	**08, 90, 85, 88**

*EOM, end of month; #SWSI, Surface Water Supply Index; ^KAF, thousand acre-feet.





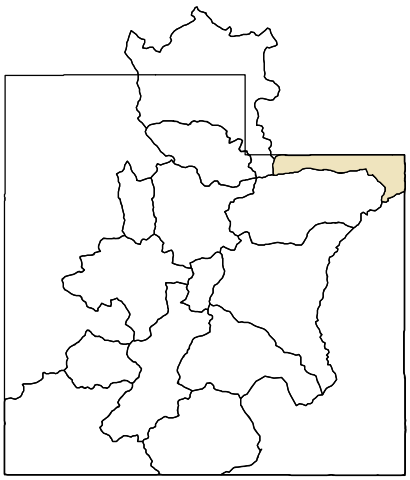
Northeastern Uinta Basin

SNOTEL Site

Forecast Point

% of Normal

- < 50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- > 150%
- No Normal



As of February 1, 2018:

88% of Normal SWE

73% of Normal Precipitation

100% of Normal Precipitation Last Month

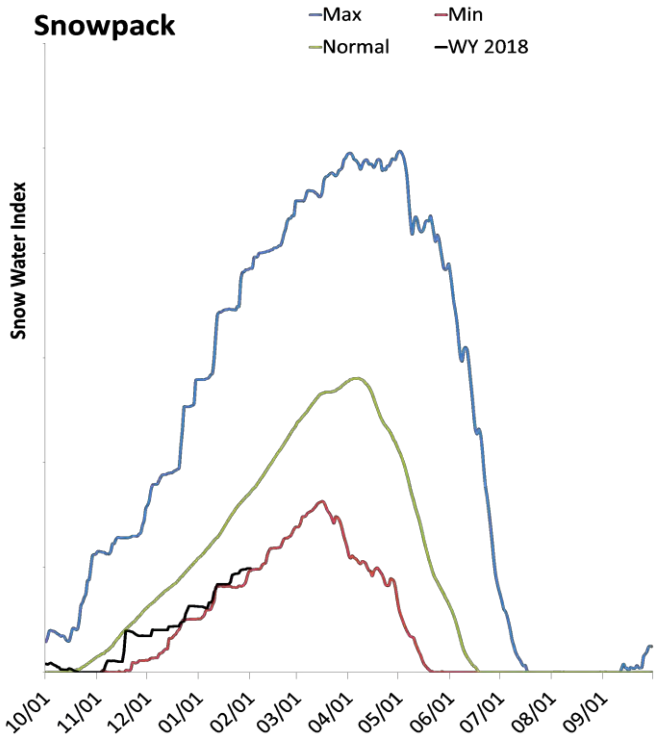
47% Saturation Soil Moisture

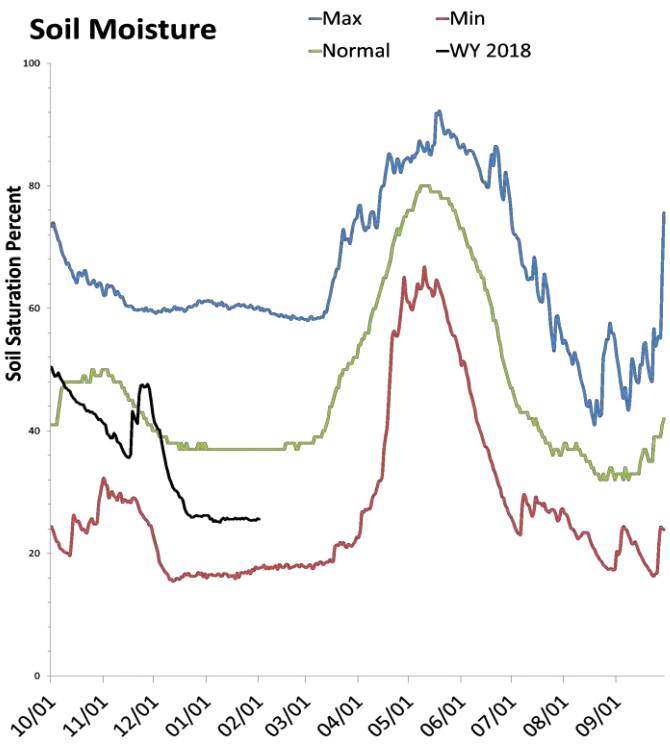
86% Reservoir Capacity

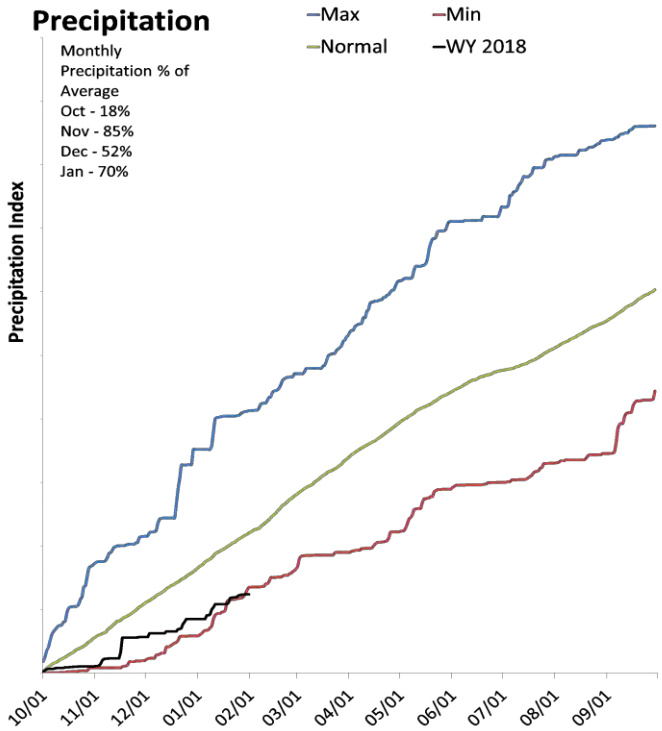
Duchesne River Basin

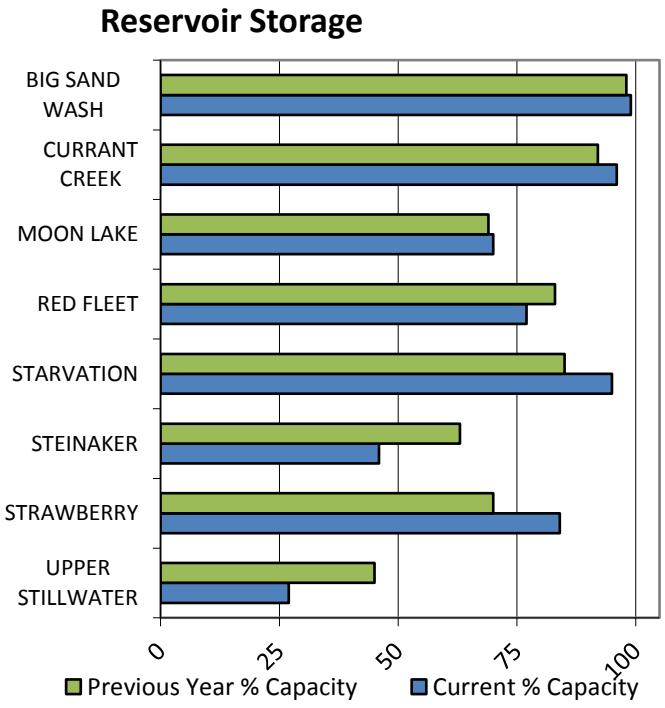
February 1, 2018

Snowpack in the Duchesne River Basin is much below average at 58% of normal, compared to 195% last year. Precipitation in January was below average at 70%, which brings the seasonal accumulation (Oct-Jan) to 56% of average. Soil moisture is at 26% compared to 55% last year. Reservoir storage is at 83% of capacity, compared to 72% last year. Forecast streamflow volumes range from 33% to 68% of average. The surface water supply index is 67% for the Western Uintas, 21% for the Eastern Uintas.









SNOTEL Data

Data Current as of: 2/6/2018 6:48:08 AM

Duchesne River
Streamflow Forecasts - February 1, 2018

Duchesne River	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment: Chance that actual volume will exceed forecast — 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
WF Duchesne R at VAT Diversion	APR-JUL	5.4	8.4	10.7	58%	13.4	17.8	18.6
Duchesne R nr Tabiona [2]	APR-JUL	38	53	66	61%	79	101	108
Upper Stillwater Reservoir Inflow[2]	APR-JUL	32	42	50	68%	59	73	74
Rock Ck nr Mountain Home [2]	APR-JUL	38	50	60	68%	70	86	88
Duchesne R ab Knight Diversion [2]	APR-JUL	76	104	125	64%	148	186	195
Currant Ck Reservoir Inflow[2]	APR-JUL	4.5	5.5	7.9	40%	10.7	15.6	20
Strawberry R nr Soldier Springs [2]	APR-JUL	11	17	20	34%	35	57	58
Strawberry R nr Duchesne [2]	APR-JUL	9.2	24	37	33%	54	83	112
Lake Fork R ab Moon Lake Reservoir	APR-JUL	22	32	40	66%	49	64	61
Lake Fk R Bl Moon Lk nr Mountain Home[2]	APR-JUL	29	35	42	64%	51	64	66
Yellowstone R nr Altonah	APR-JUL	22	32	39	64%	48	61	61
Duchesne R at Myton [2]	APR-JUL	55	102	143	43%	190	275	330
Uinta R bl Powerplant Diversion nr Neola[2]	APR-JUL	22	33	45	61%	59	84	74
Whiterocks R nr Whiterocks	APR-JUL	16.4	26	34	63%	44	59	54
Duchesne R nr Randlett [2]	APR-JUL	80	92	149	39%	220	350	385
Ashley Ck nr Vernal	APR-JUL	14.1	23	30	60%	38	52	50
Big Brush Ck ab Red Fleet Reservoir	APR-JUL	8	10.3	14	67%	17.7	23	21

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of January, 2018	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Steinaker Reservoir	15.4	21.2	21.7	33.4
Red Fleet Reservoir	19.8	21.4	17.9	25.7
Big Sand Wash Reservoir	25.5	25.2		25.7
Upper Stillwater Reservoir	8.8	14.5	8.6	32.5
Starvation Reservoir	157.0	140.2	138.8	165.3
Moon Lake Reservoir	25.2	24.7	24.4	35.8
Currant Creek Reservoir	14.8	14.2	14.9	15.5
Strawberry Reservoir	930.5	776.4	658.4	1105.9
Basin-wide Total	1171.4	1012.6	884.7	1414.1
# of reservoirs	7	7	7	7

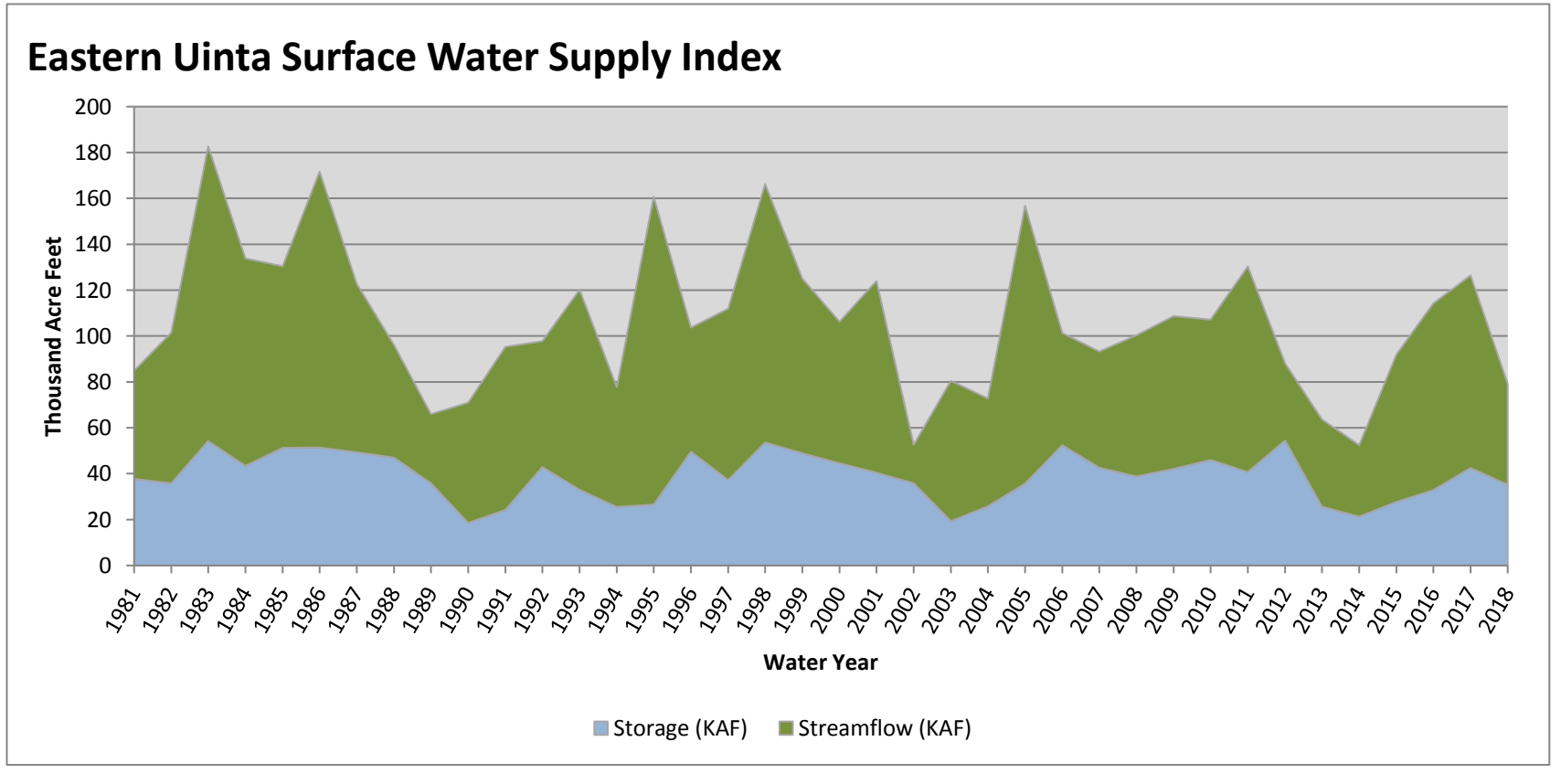
Watershed Snowpack Analysis February 1, 2018	# of Sites	% Median	Last Year % Median
Strawberry River	5	45%	210%
Lakefork Yellowstone Rivers	6	67%	192%
Uinta Whiterocks River	2	51%	173%

February 1, 2018

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Eastern Uinta	**35.16**	**44.00**	**79.16**	**21**	**-2.46**	**04, 94, 03, 81**

*EOM, end of month; #SWSI, Surface Water Supply Index; ^KAF, thousand acre-feet.

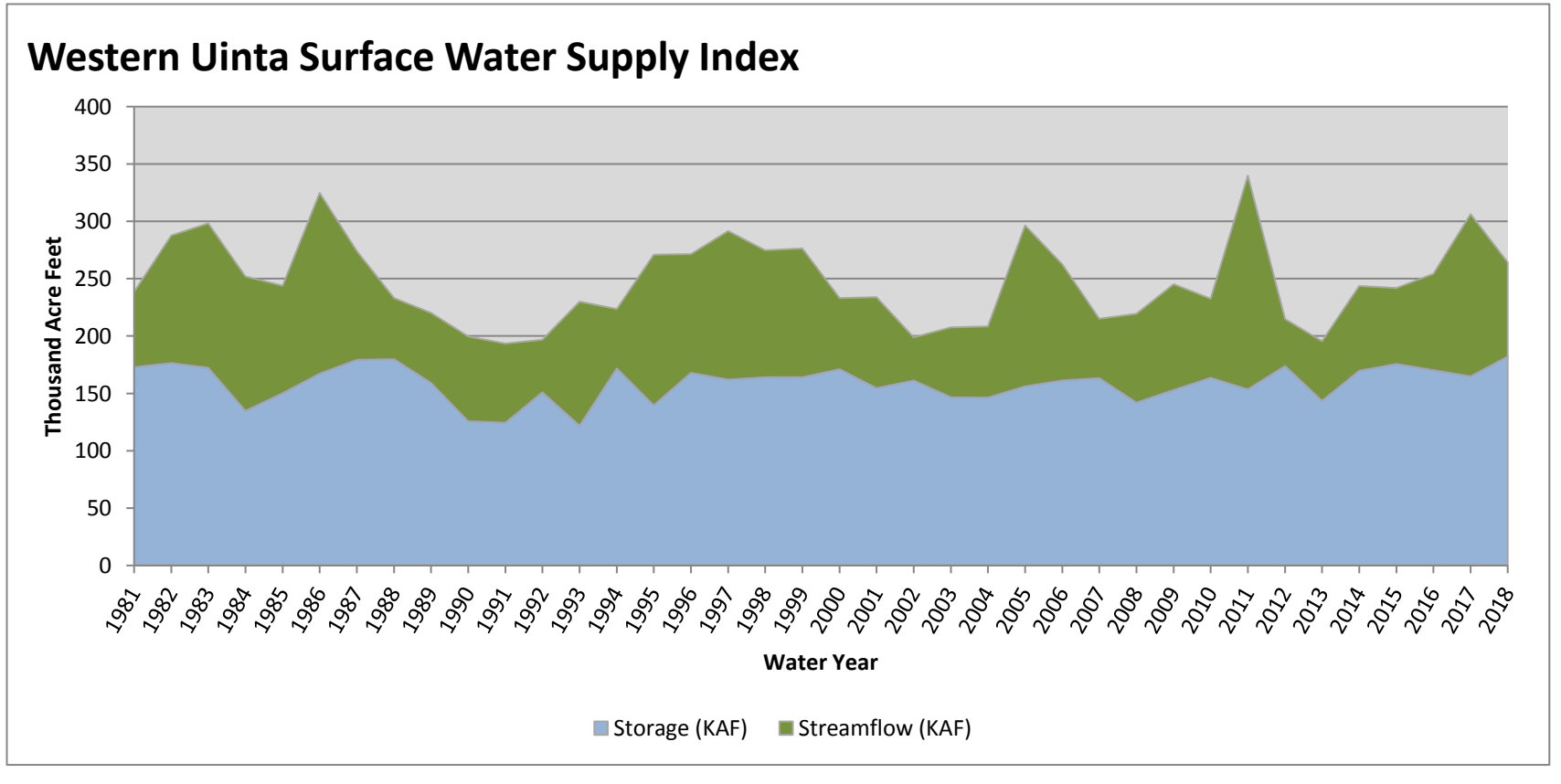


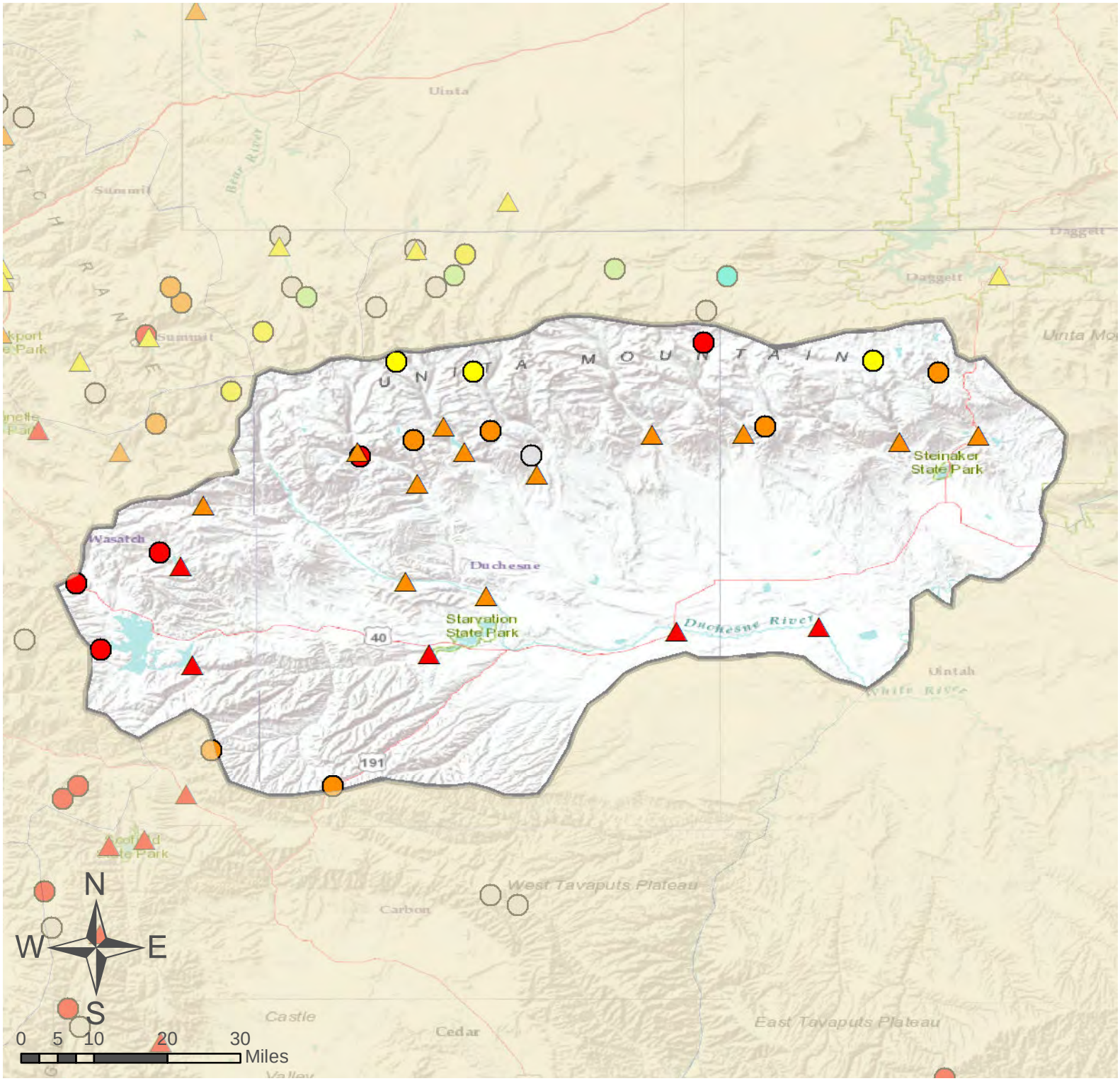
February 1, 2018

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Western Uinta	**182.17**	**82.00**	**264.17**	**67**	**1.39**	**16, 06, 95, 96**

*EOM, end of month; #SWSI, Surface Water Supply Index; ^KAF, thousand acre-feet.





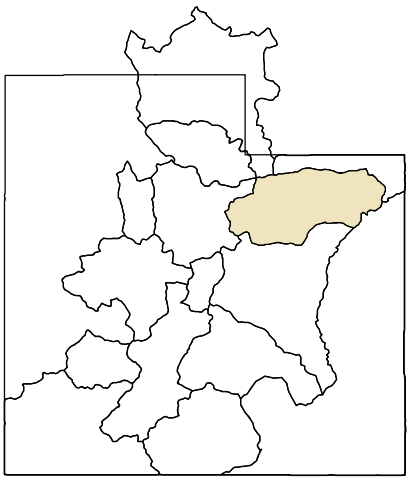
Duchesne River Basin

SNOTEL Site

Forecast Point

% of Normal

- < 50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- > 150%
- No Normal



As of February 1, 2018:

58% of Normal SWE

56% of Normal Precipitation

70% of Normal Precipitation Last Month

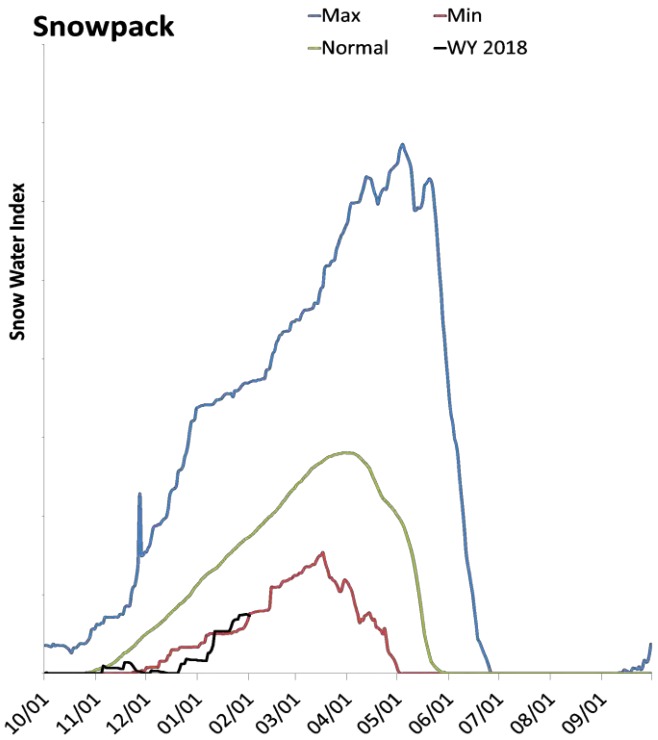
26% Saturation Soil Moisture

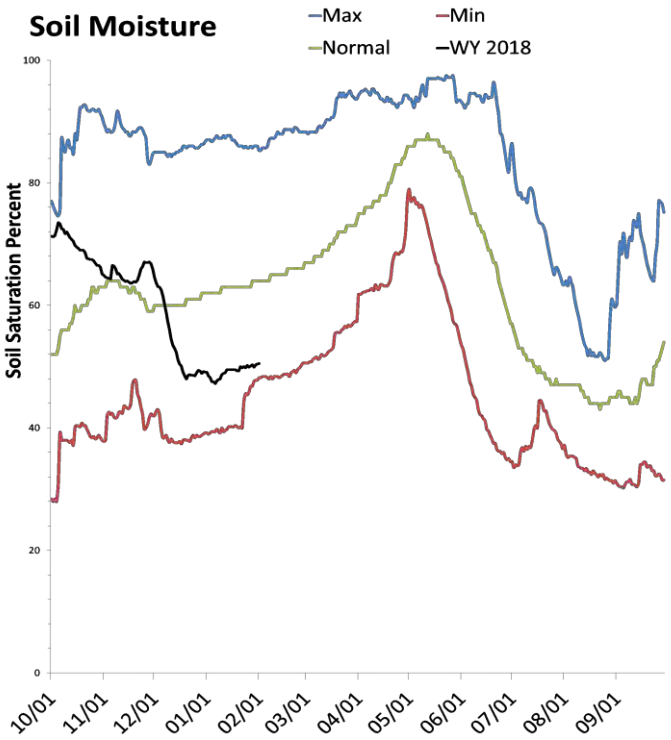
83% Reservoir Capacity

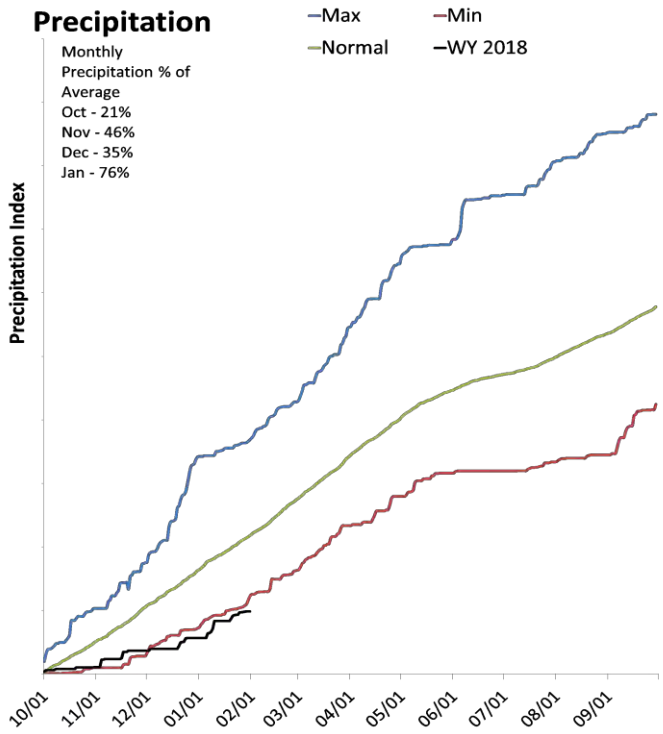
San Pitch River Basin

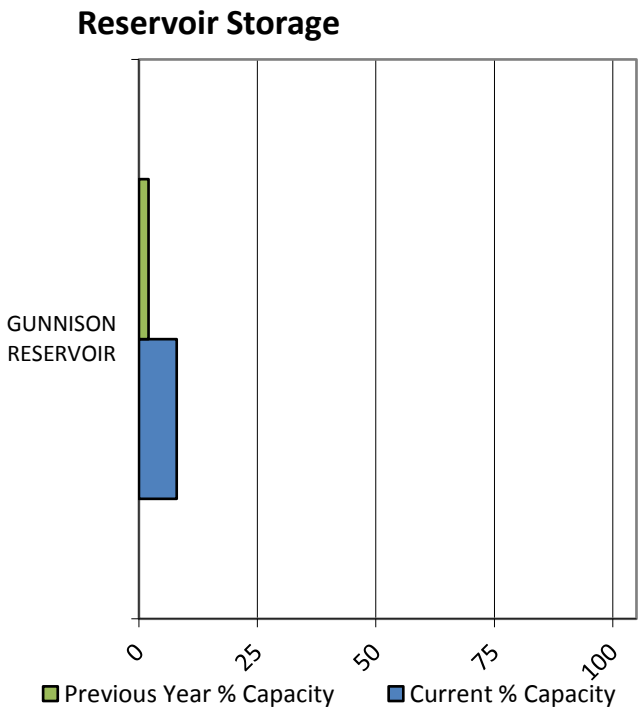
February 1, 2018

Snowpack in the San Pitch River Basin is much below normal at 42% of normal, compared to 169% last year. Precipitation in January was below average at 76%, which brings the seasonal accumulation (Oct-Jan) to 45% of average. Soil moisture is at 50% compared to 80% last year. Reservoir storage is at 8% of capacity, compared to 2% last year. The forecast streamflow volume for Manti Creek is 41% of average. The surface water supply index is 5% for the San Pitch.









SNOTEL Data

Data Current as of: 2/6/2018 6:48:28 AM

San Pitch River
Streamflow Forecasts - February 1, 2018

		Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						
San Pitch River	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Manti Ck bl Dugway Ck nr Manti								
	APR-JUL	2.8	5	6.8	41%	8.9	12.6	16.7
Sevier R nr Gunnison								
	APR-JUL	5	21	36	36%	57	89	99

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of January, 2018	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Gunnison Reservoir	1.6	0.4	11.4	20.3
Basin-wide Total	1.6	0.4	11.4	20.3
# of reservoirs	1	1	1	1

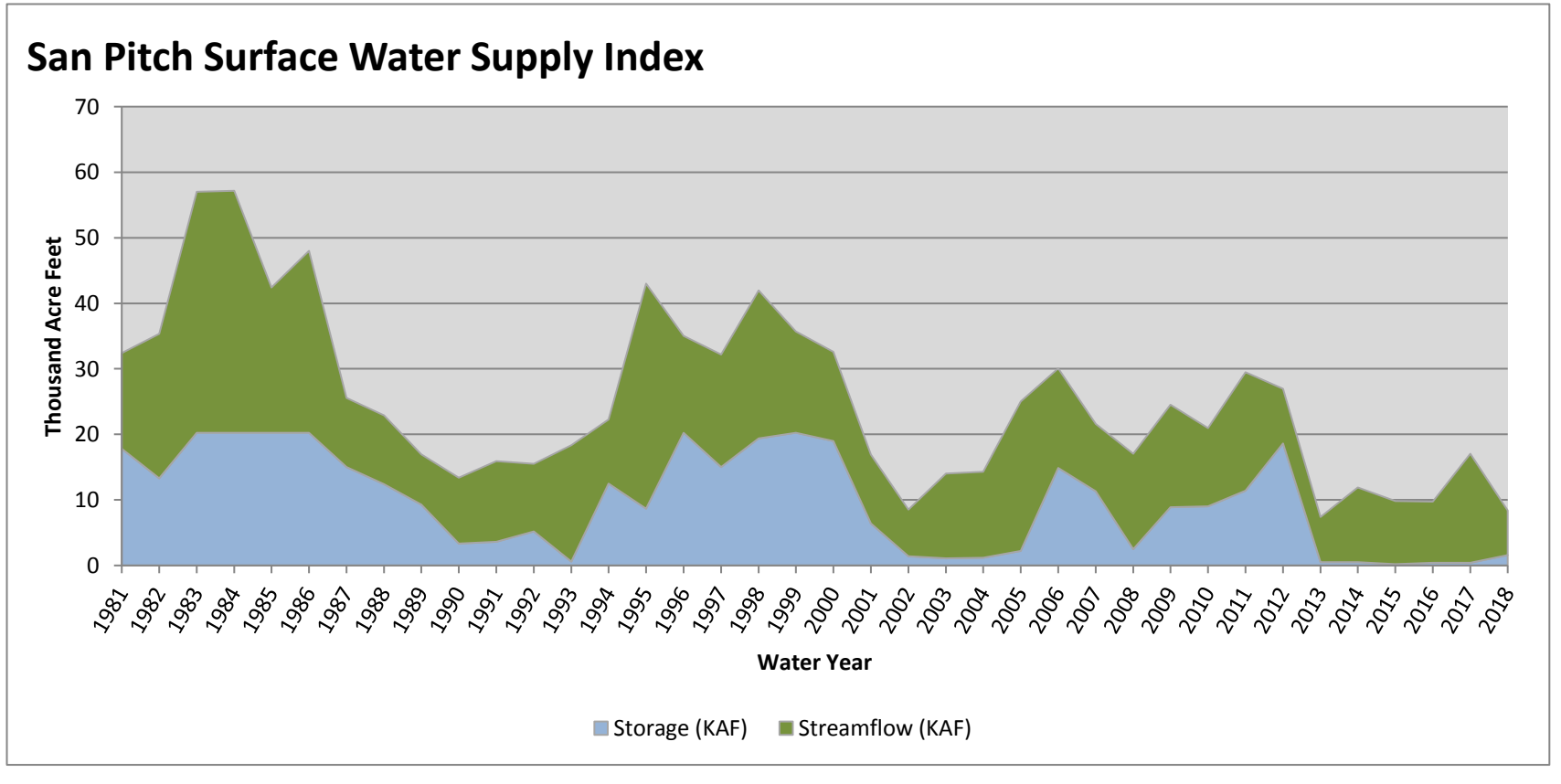
Watershed Snowpack Analysis February 1, 2018	# of Sites	% Median	Last Year % Median
Upper San Pitch	2	40%	193%
Lower San Pitch	5	42%	169%

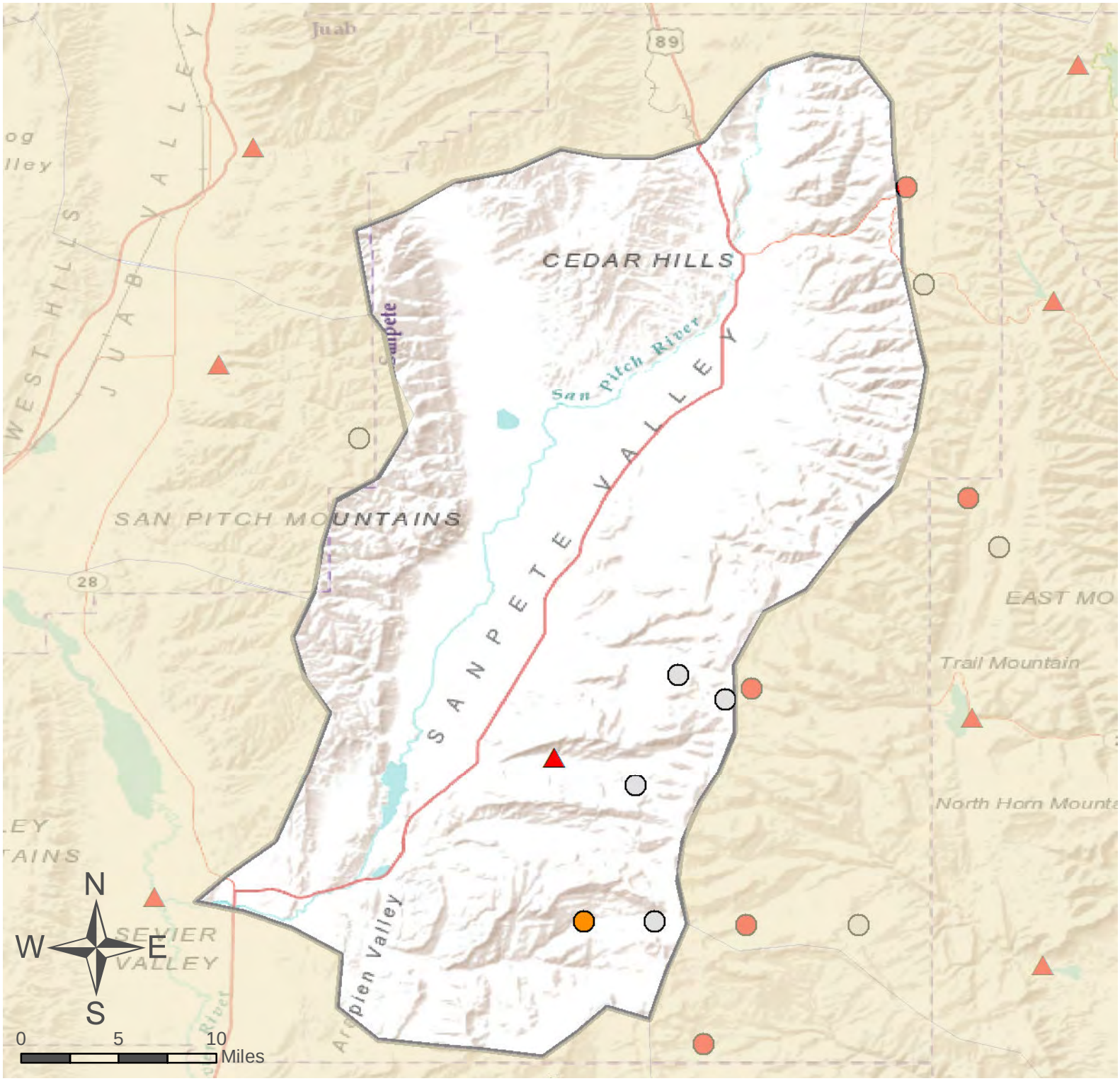
February 1, 2018

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
San Pitch	**1.58**	**6.80**	**8.38**	**5**	**-3.74**	**13, 02, 16, 15**

*EOM, end of month; #SWSI, Surface Water Supply Index; ^KAF, thousand acre-feet.





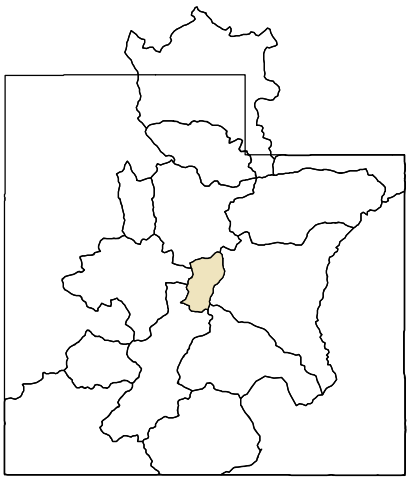
San Pitch River Basin

SNOTEL Site

Forecast Point

% of Normal

- < 50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- > 150%
- No Normal



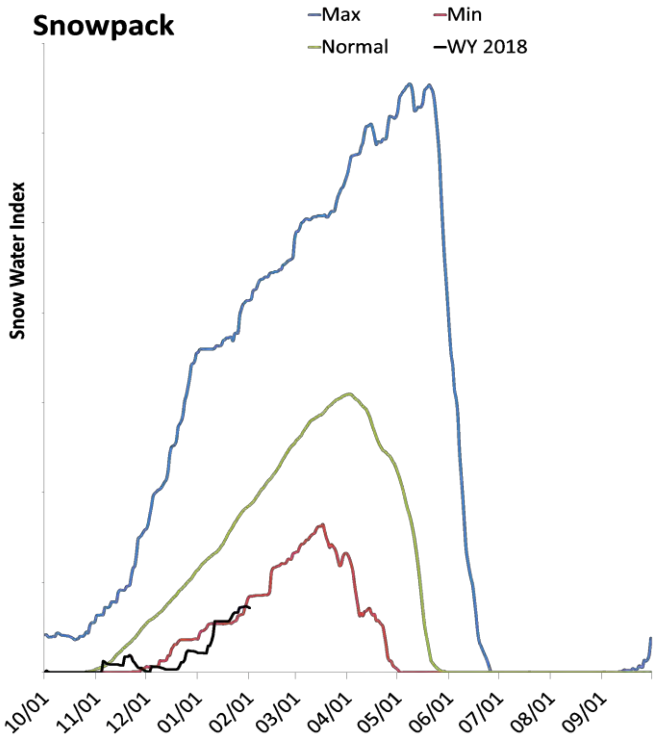
As of February 1, 2018:

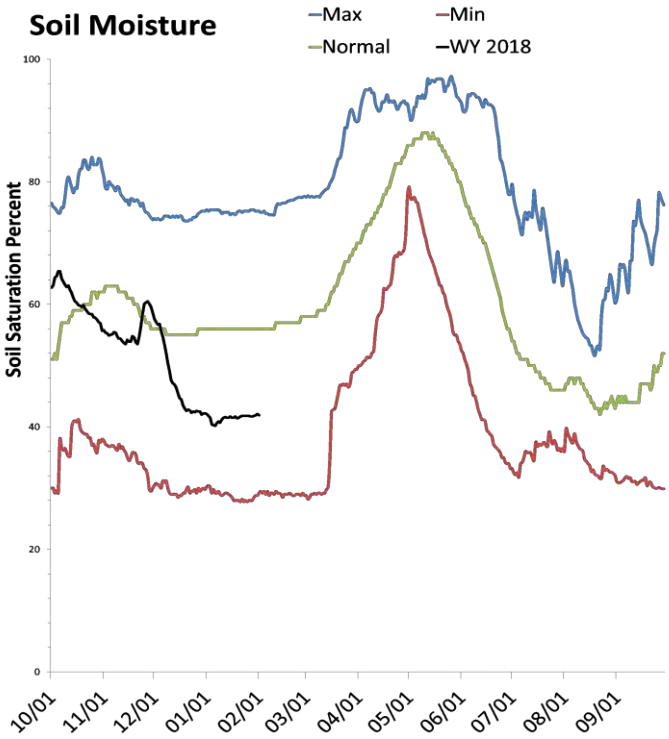
- 42% of Normal SWE
- 45% of Normal Precipitation
- 76% of Normal Precipitation Last Month
- 50% Saturation Soil Moisture
- 8% Reservoir Capacity

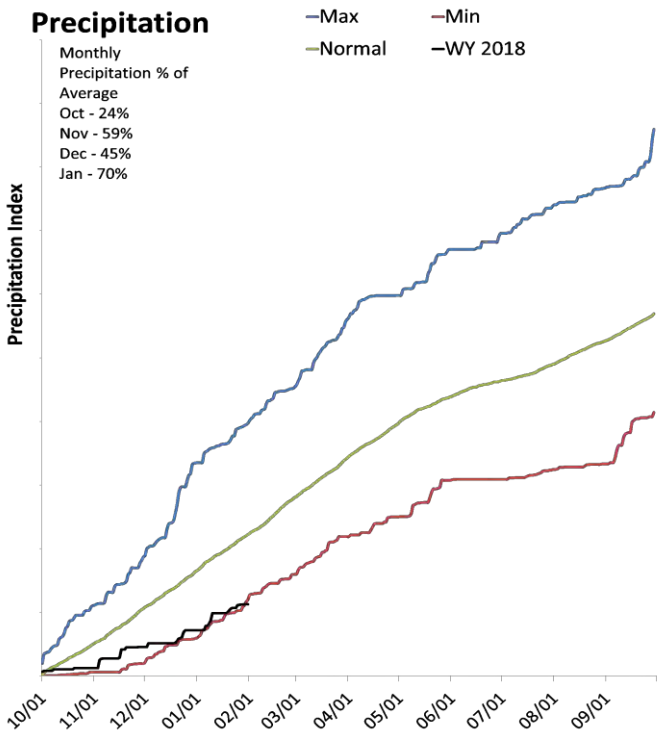
Price & San Rafael Basins

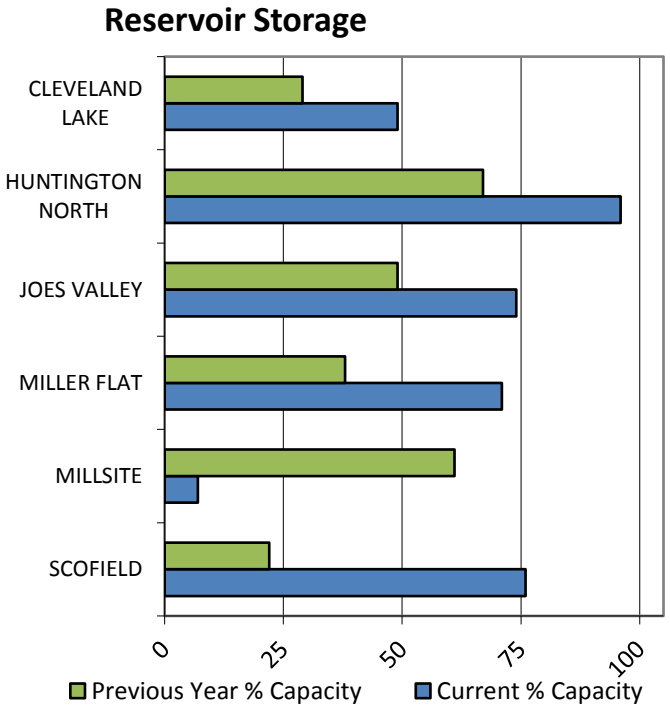
February 1, 2018

Snowpack in the Price & San Rafael Basins is much below normal at 39% of normal, compared to 178% last year. Precipitation in January was below average at 70%, which brings the seasonal accumulation (Oct-Jan) to 51% of average. Soil moisture is at 42% compared to 76% last year. Reservoir storage is at 68% of capacity, compared to 39% last year. Forecast streamflow volumes range from 29% to 58% of average. The surface water supply index is 62% for the Price River, 23% for Joe's Valley, 3% for Ferron Creek.









SNOTEL Data

Data Current as of: 2/6/2018 6:48:11 AM

Price San Rafael Rivers
Streamflow Forecasts - February 1, 2018

Price San Rafael Rivers	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
		Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						
Fish Ck ab Reservoir nr Scofield	APR-JUL	6	7.7	11	37%	15	22	30
Price R nr Scofield Reservoir[2]	APR-JUL	8	11	14	34%	20	32	41
White R bl Tabbyune Creek	APR-JUL	1.26	2.9	4.5	29%	6.4	9.7	15.5
Green R at Green River, UT [2]	APR-JUL	900	1360	1720	58%	2130	2810	2960
Electric Lake Inflow [2]	APR-JUL	3	3.7	4.2	32%	5.9	8.9	13.3
Huntington Ck nr Huntington [2]	APR-JUL	15	16	17	43%	22	30	40
Joes Valley Reservoir Inflow[2]	APR-JUL	15	19.4	25	45%	31	42	56
Ferron Ck (Upper Station) nr Ferron	APR-JUL	9	12.9	16	42%	19.4	25	38

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of January, 2018	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Joes Valley Reservoir	45.3	30.4	39.9	61.6
Millsite	1.2	10.2	10.1	16.7
Huntington North Reservoir	4.0	2.8	2.7	4.2
Cleveland Lake	2.7	1.6		5.4
Miller Flat Reservoir	3.7	2.0		5.2
Scofield Reservoir	50.0	14.5	29.9	65.8
Basin-wide Total	100.4	57.9	82.6	148.3
# of reservoirs	4	4	4	4

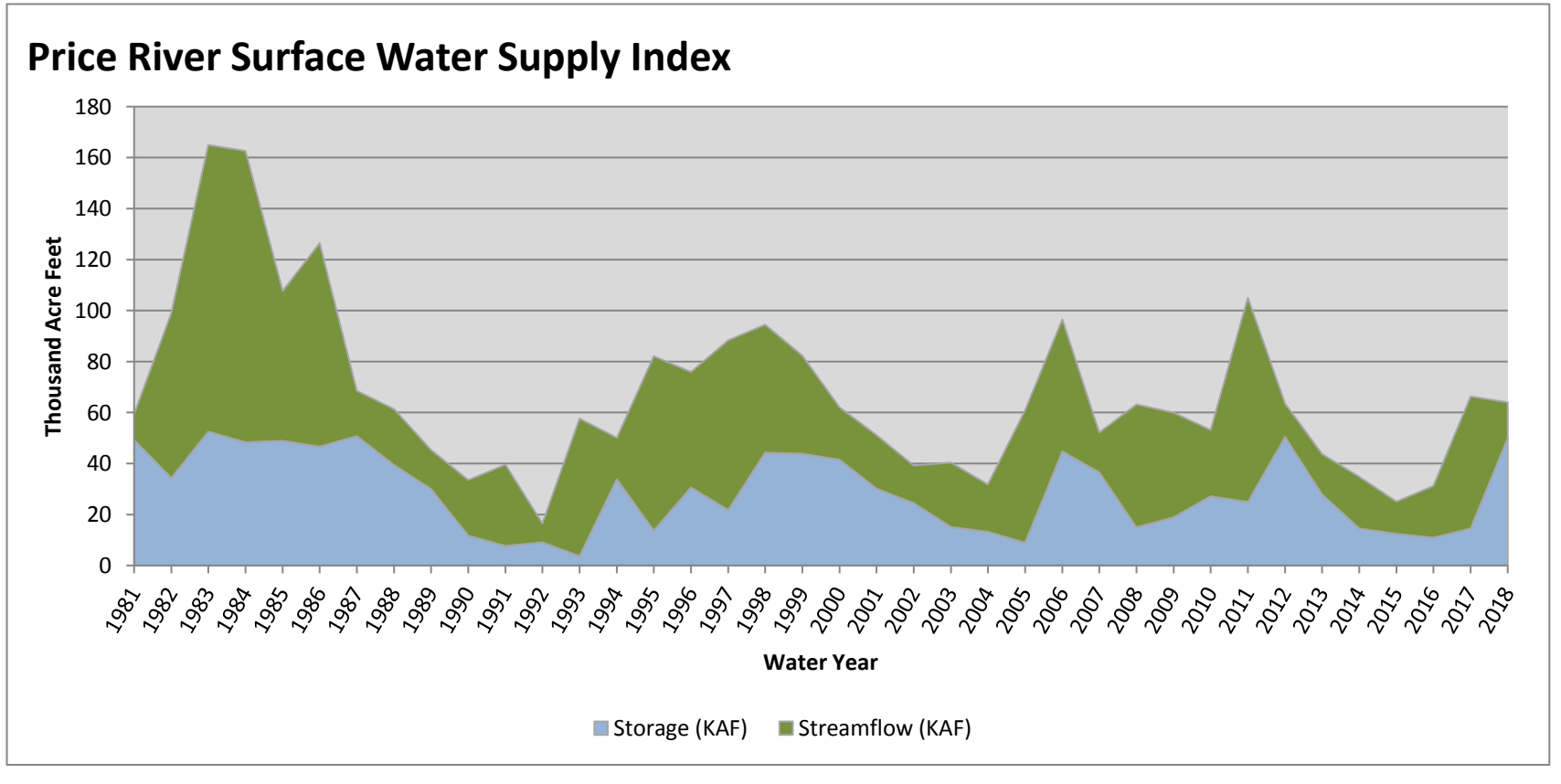
Watershed Snowpack Analysis February 1, 2018	# of Sites	% Median	Last Year % Median
Price River	4	42%	191%
San Rafael	4	37%	178%

February 1, 2018

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Price River	**49.97**	**14.00**	**63.97**	**62**	**0.96**	**08, 12, 17, 87**

*EOM, end of month; #SWSI, Surface Water Supply Index; ^KAF, thousand acre-feet.

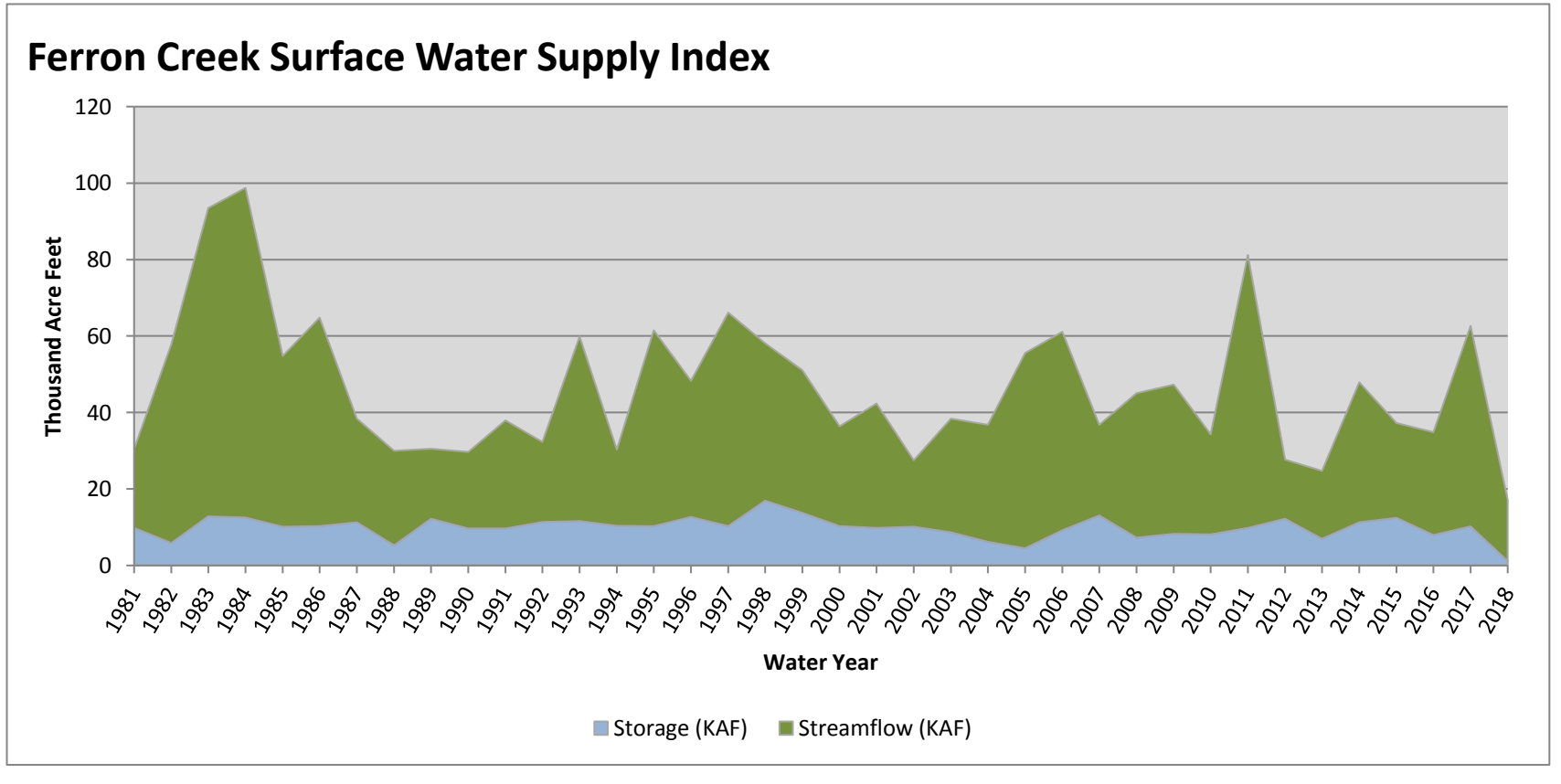


February 1, 2018

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Ferron Creek	**1.15**	**16.00**	**17.15**	**3**	**-3.95**	**13, 02, 12, 90**

*EOM, end of month; #SWSI, Surface Water Supply Index; ^KAF, thousand acre-feet.

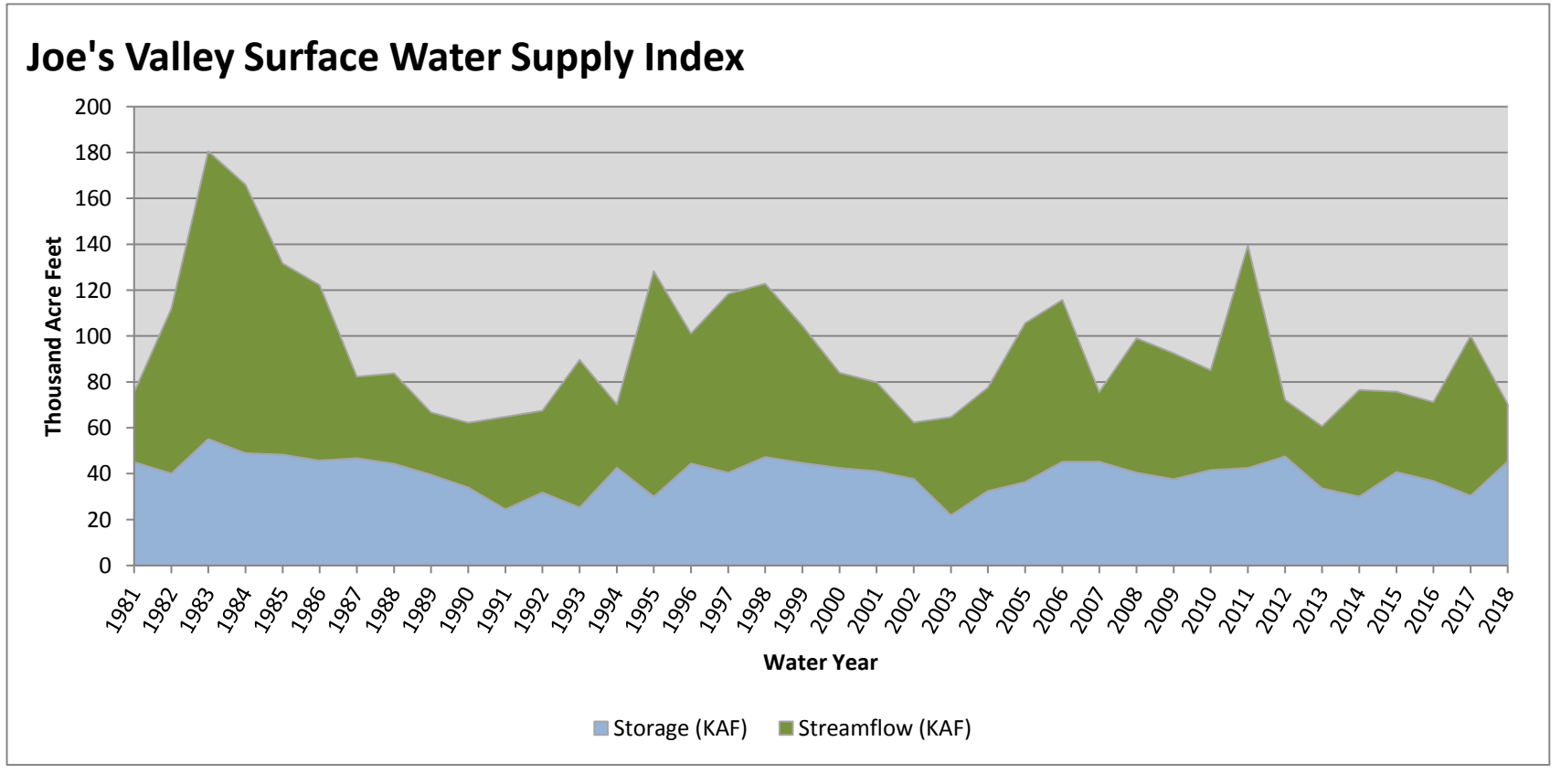


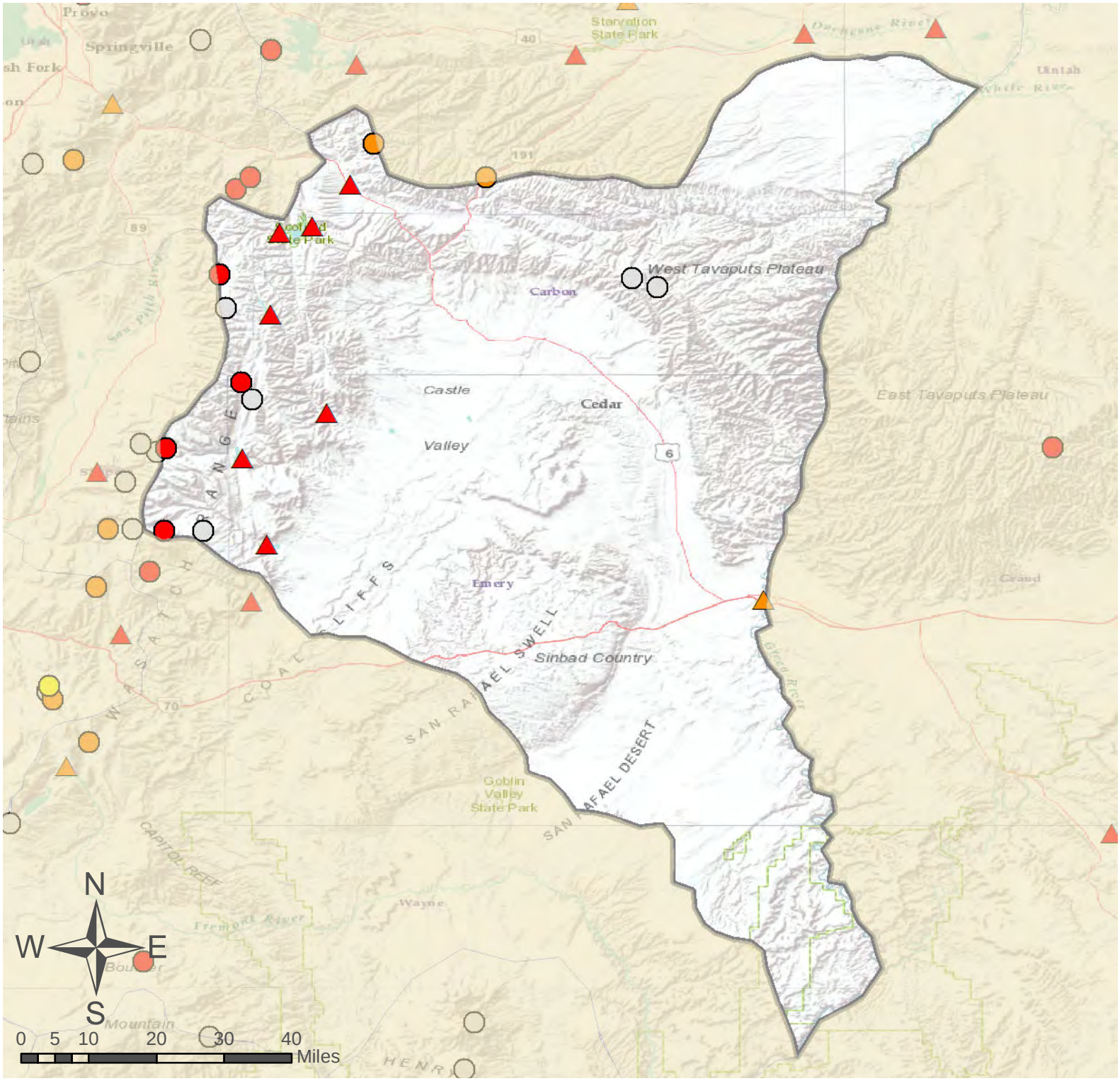
February 1, 2018

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Joe's Valley	**45.30**	**25.00**	**70.30**	**23**	**-2.24**	**92, 94, 16, 12**

*EOM, end of month; #SWSI, Surface Water Supply Index; ^KAF, thousand acre-feet.





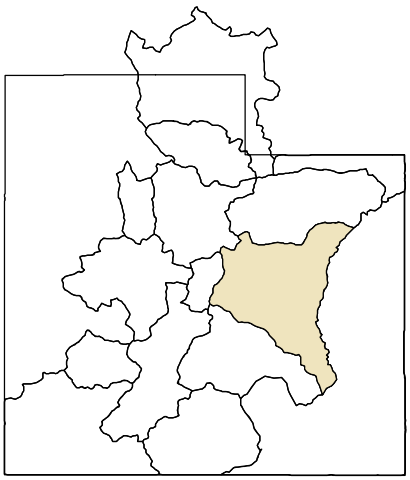
Price & San Rafael Basins

SNOTEL Site

Forecast Point

% of Normal

- < 50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- > 150%
- No Normal



As of February 1, 2018:

39% of Normal SWE

51% of Normal Precipitation

70% of Normal Precipitation Last Month

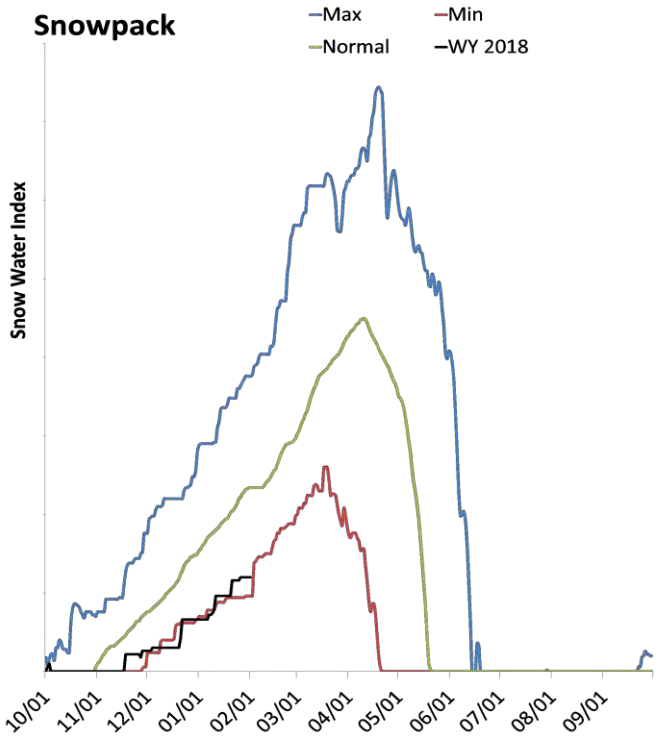
42% Saturation Soil Moisture

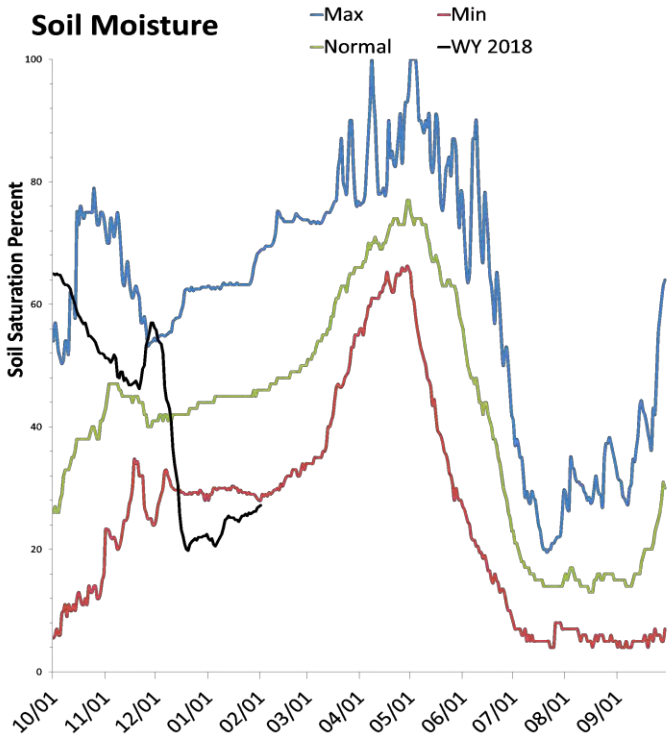
68% Reservoir Capacity

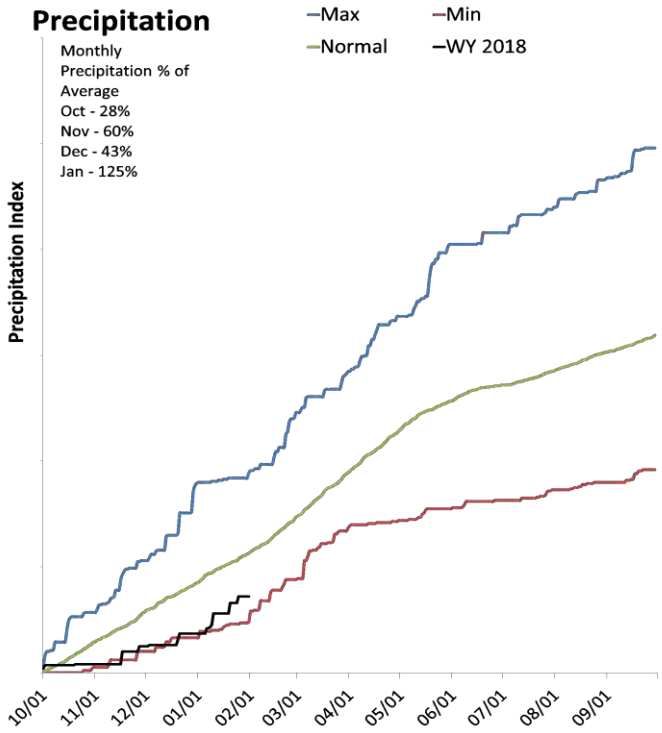
Lower Sevier Basin

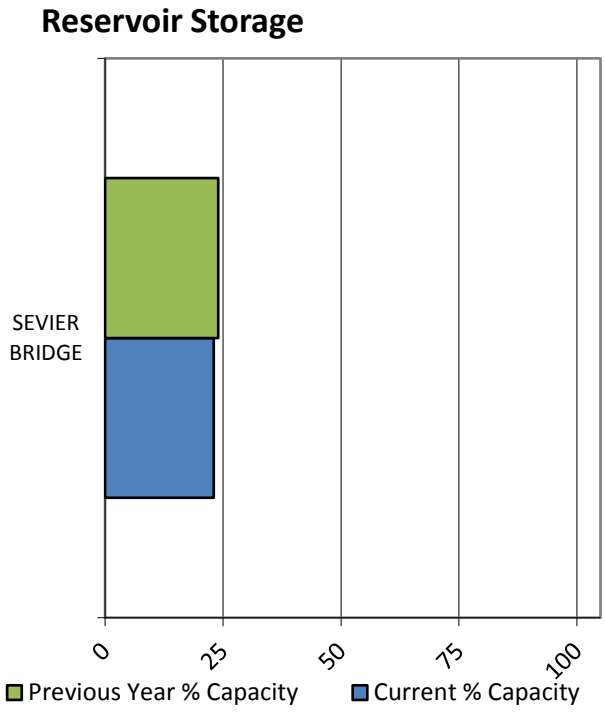
February 1, 2018

Snowpack in the Lower Sevier Basin is much below normal at 51% of normal, compared to 139% last year. Precipitation in January was above average at 125%, which brings the seasonal accumulation (Oct-Jan) to 64% of average. Soil moisture is at 27% compared to 66% last year. Reservoir storage is at 23% of capacity, compared to 24% last year. Forecast streamflow volumes range from 16% to 36% of average. The surface water supply index is 10% for the Lower Sevier.









SNOTEL Data

Data Current as of: 2/6/2018 6:48:34 AM

Lower Sevier
Streamflow Forecasts - February 1, 2018

Lower Sevier	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
		Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						
Chicken Ck nr Levan								
	APR-JUL	0.09	0.36	0.7	16%	1.22	2.4	4.5
Sevier R nr Gunnison								
	APR-JUL	5	21	36	36%	57	89	99
Oak Ck nr Oak City								
	APR-JUL	0.08	0.24	0.4	24%	0.6	0.96	1.66

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of January, 2018	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Sevier Bridge Reservoir	54.7	57.0	155.7	236.0
Basin-wide Total	54.7	57.0	155.7	236.0
# of reservoirs	1	1	1	1

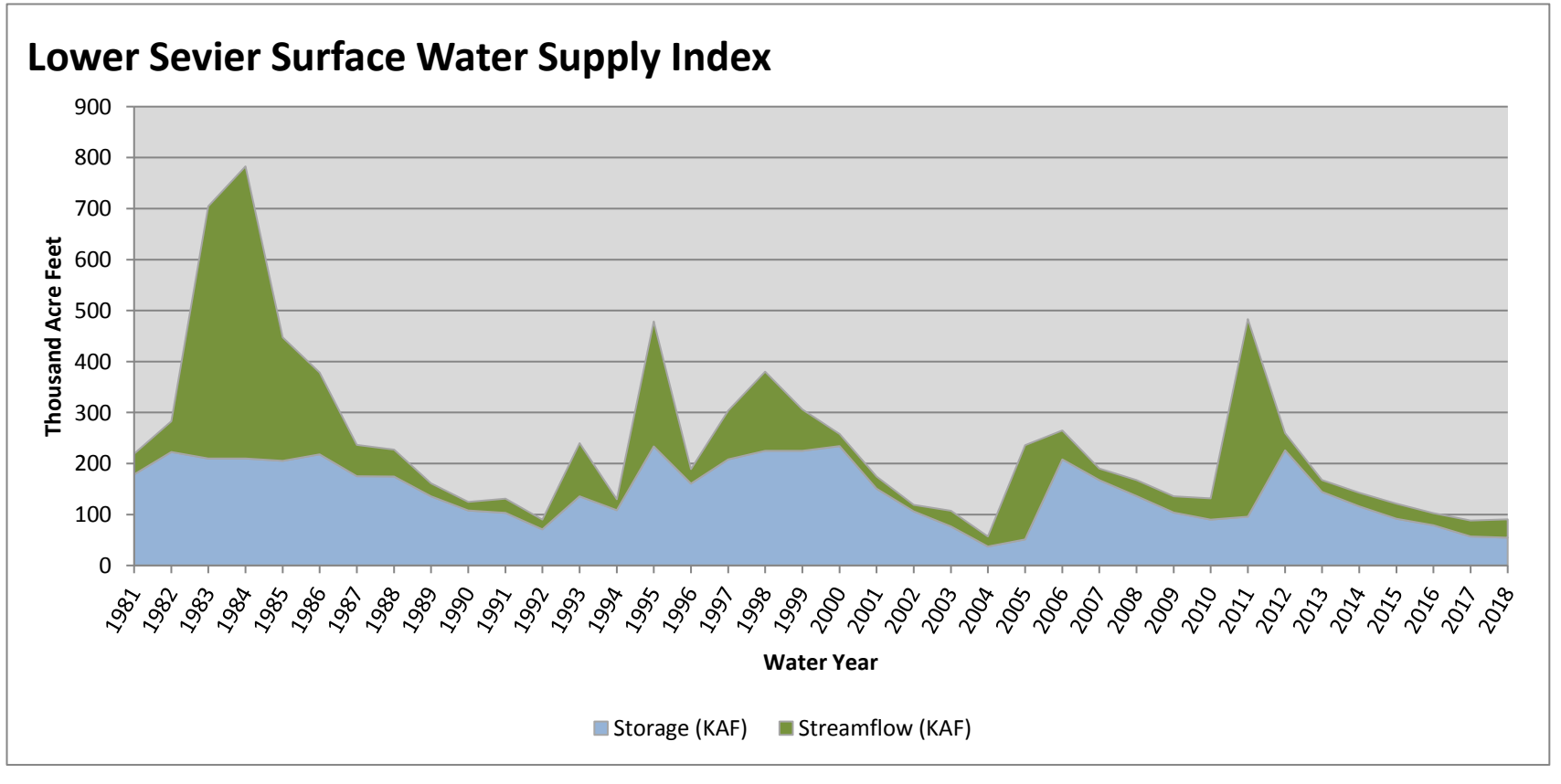
Watershed Snowpack Analysis February 1, 2018	# of Sites	% Median	Last Year % Median
Lower Sevier	1	51%	139%

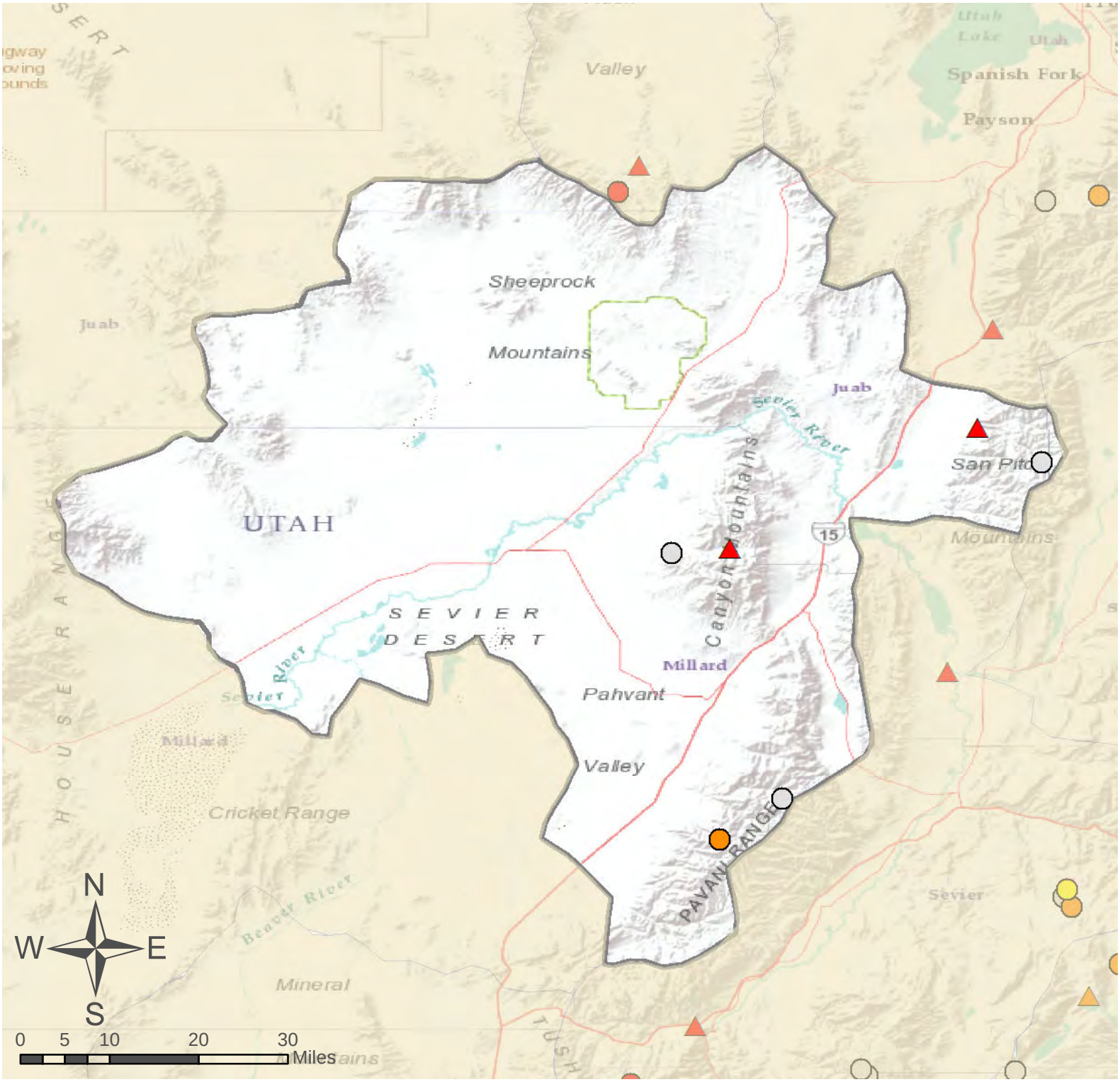
February 1, 2018

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Lower Sevier	**54.70**	**36.00**	**90.70**	**10**	**-3.31**	**17, 92, 16, 03**

*EOM, end of month; #SWSI, Surface Water Supply Index; ^KAF, thousand acre-feet.





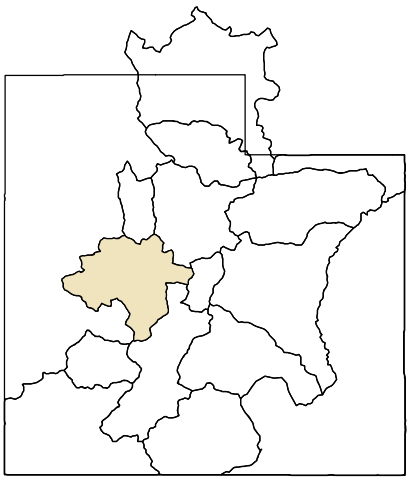
Lower Sevier Basin

SNOTEL Site

Forecast Point

% of Normal

- < 50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- > 150%
- No Normal



As of February 1, 2018:

51% of Normal SWE

64% of Normal Precipitation

125% of Normal Precipitation Last Month

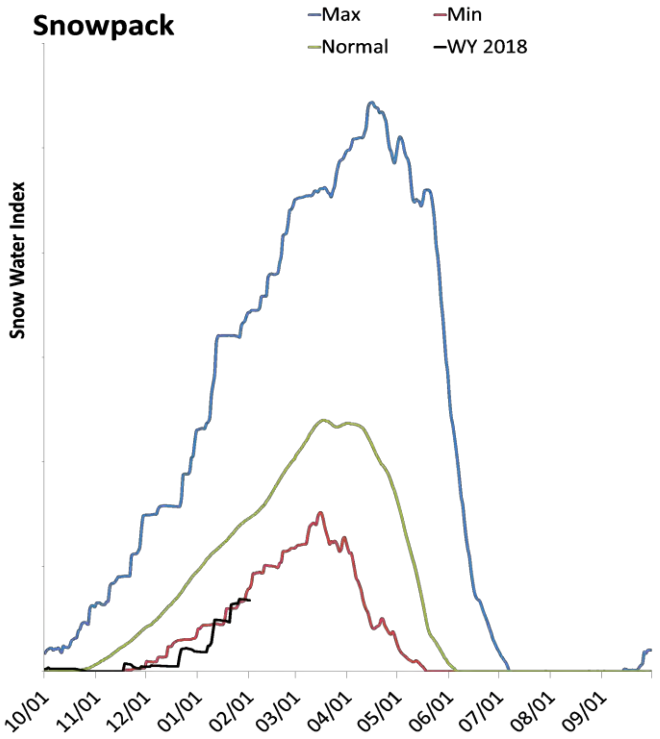
27% Saturation Soil Moisture

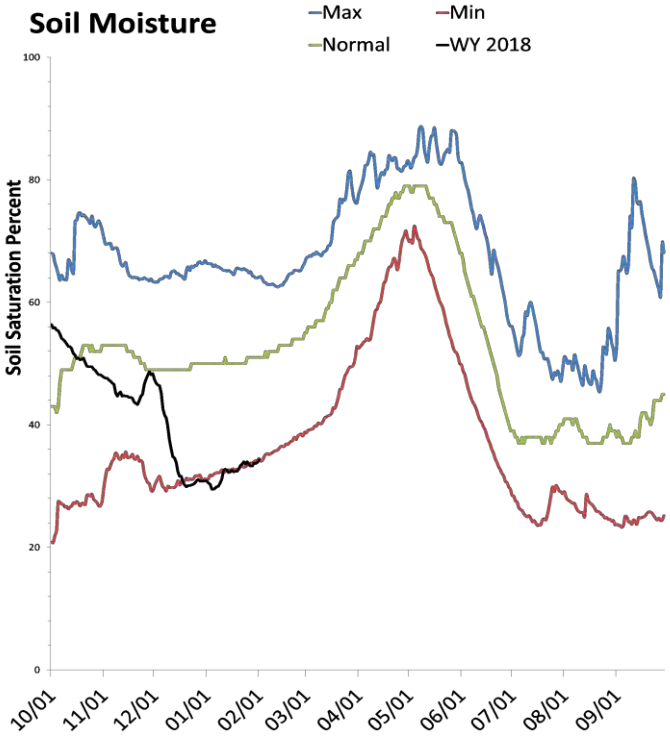
23% Reservoir Capacity

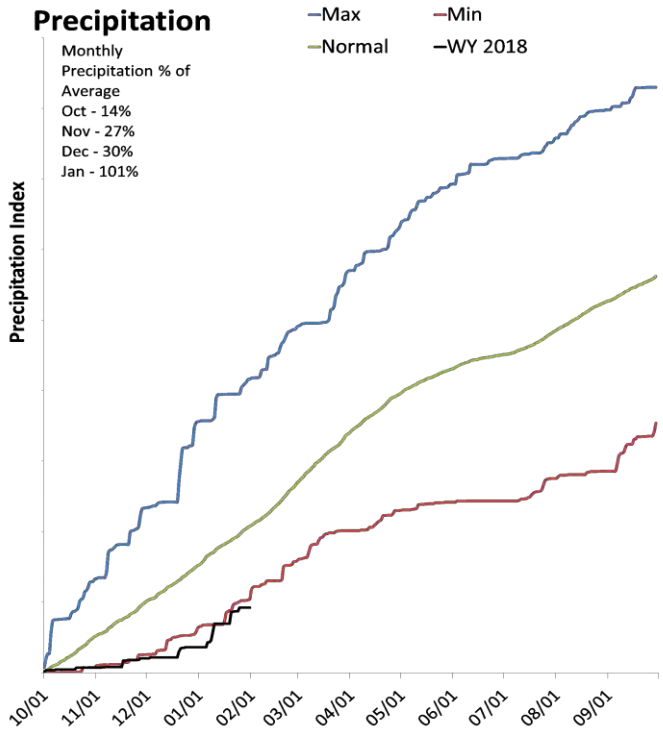
Upper Sevier Basin

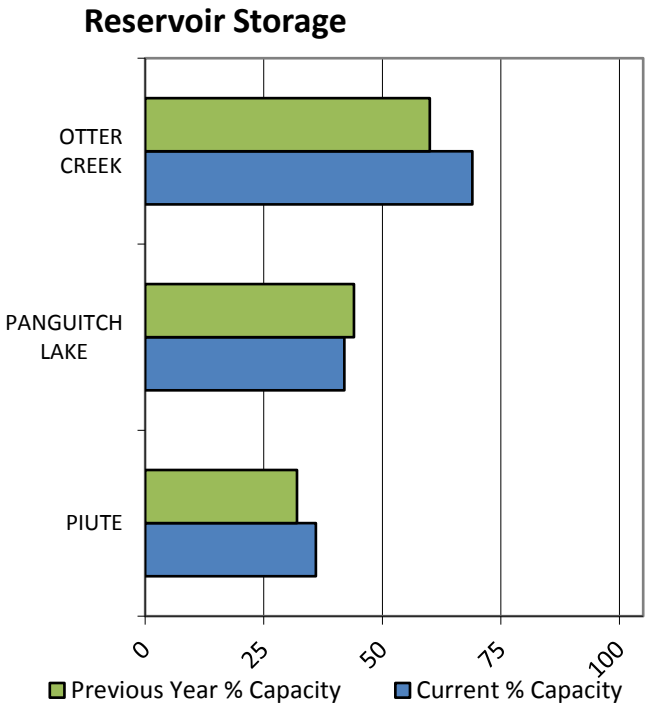
February 1, 2018

Snowpack in the Upper Sevier Basin is much below normal at 46% of normal, compared to 167% last year. Precipitation in January was near average at 101%, which brings the seasonal accumulation (Oct-Jan) to 44% of average. Soil moisture is at 34% compared to 59% last year. Reservoir storage is at 49% of capacity, compared to 44% last year. Forecast streamflow volumes range from 18% to 39% of average. The surface water supply index is 13% for the Upper Sevier.









SNOTEL Data

Data Current as of: 2/6/2018 6:48:26 AM

Upper Sevier
Streamflow Forecasts - February 1, 2018

Upper Sevier	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment: Chance that actual volume will exceed forecast — 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Mammoth Ck nr Hatch	APR-JUL	0.27	1.89	4.9	18%	17.6	31	27
Sevier R at Hatch	APR-JUL	1.44	4.1	14	29%	24	38	48
EF Sevier R nr Kingston	APR-JUL	0.35	0.95	10	29%	19.1	32	35
Sevier R nr Kingston	APR-JUL	0.99	3.6	12.9	39%	20	38	33
Sevier R bl Piute Dam	APR-JUL	1.32	7.9	23	35%	45	64	66
Clear Ck ab Diversions nr Sevier	APR-JUL	0.42	1.68	5	24%	9.9	17.1	21
Salina Ck nr Emery	APR-JUL	0.24	0.55	2	25%	3.7	7.5	7.9

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of January, 2018	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Piute Reservoir	25.6	23.2	49.2	71.8
Otter Creek Reservoir	36.2	31.7	35.0	52.5
Panguitch Lake	9.4	9.9	12.7	22.3
Basin-wide Total	71.2	64.7	96.9	146.6
# of reservoirs	3	3	3	3

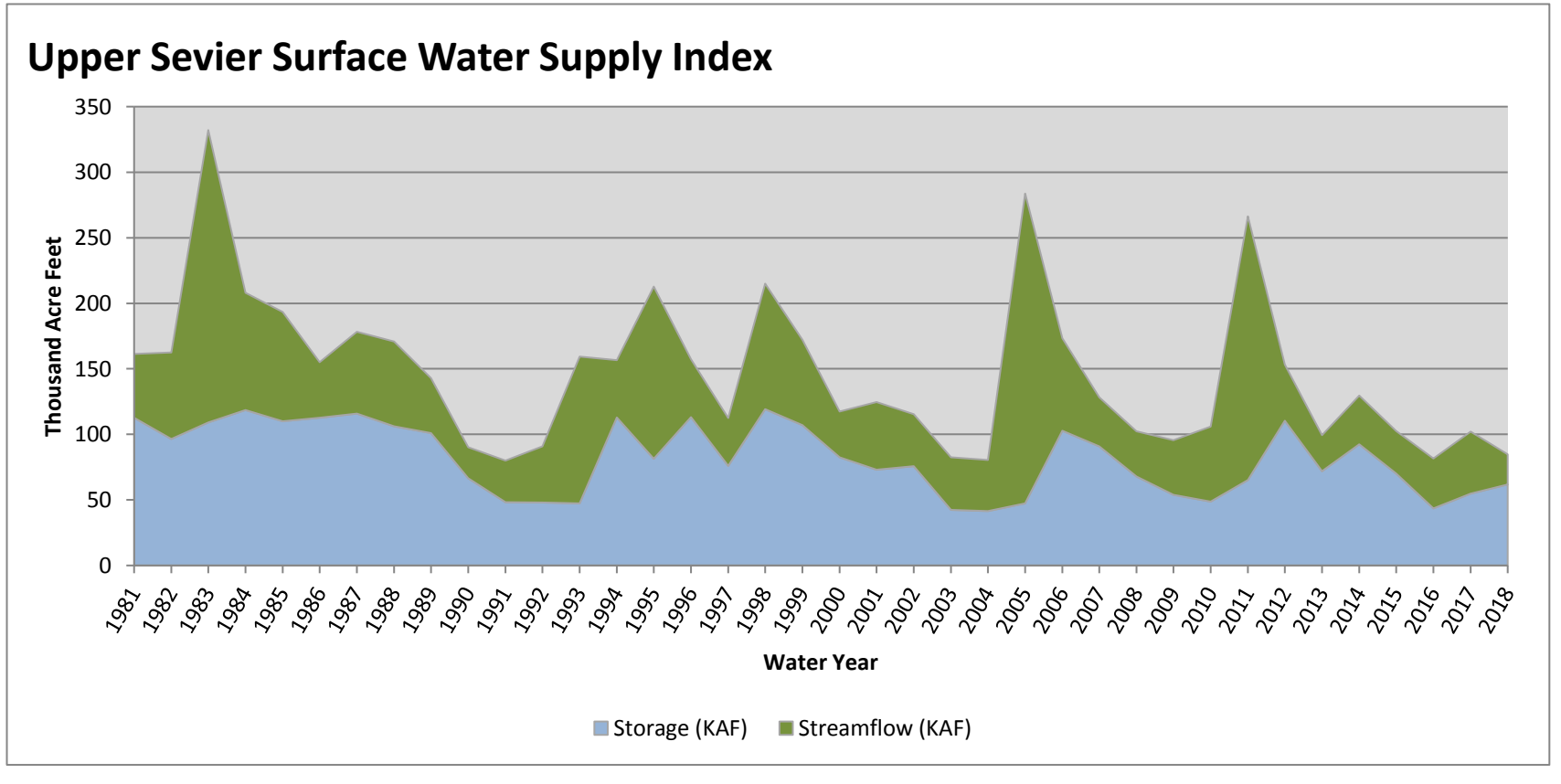
Watershed Snowpack Analysis February 1, 2018	# of Sites	% Median	Last Year % Median
Upper Sevier	12	46%	167%
Middle Sevier	7	49%	148%
East Fork Sevier River	3	35%	161%

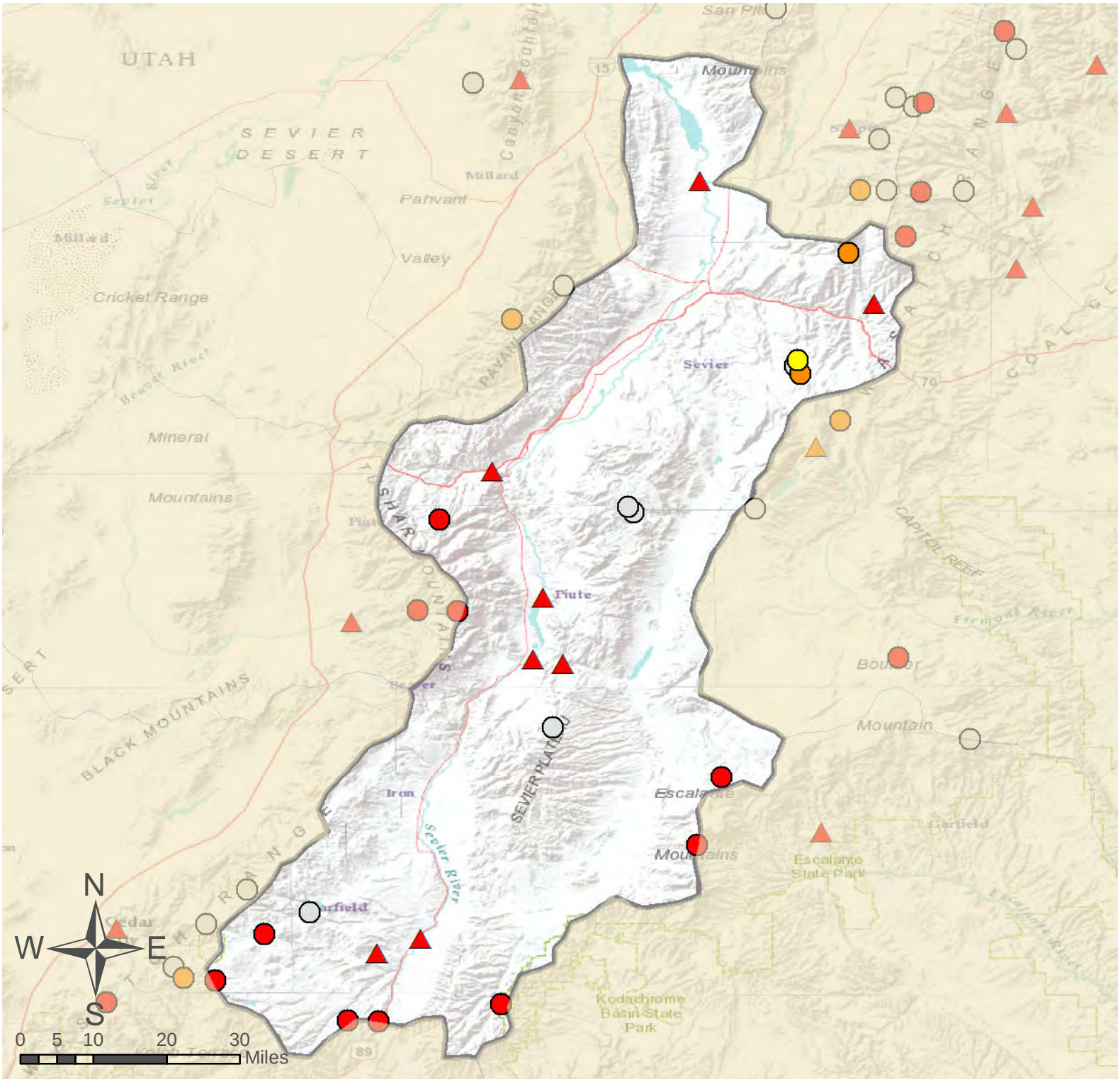
February 1, 2018

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Upper Sevier	**61.75**	**23.00**	**84.75**	**13**	**-3.1**	**16, 03, 90, 92**

*EOM, end of month; #SWSI, Surface Water Supply Index; ^KAF, thousand acre-feet.





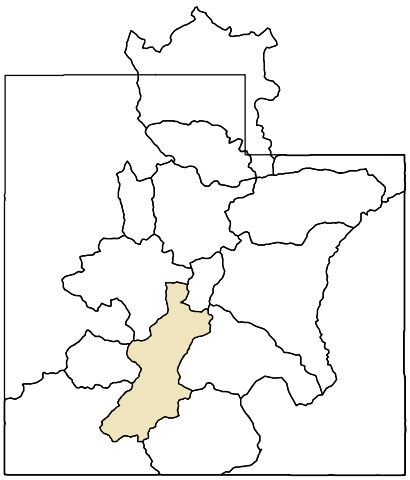
Upper Sevier Basin

SNOTEL Site

Forecast Point

% of Normal

- < 50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- > 150%
- No Normal



As of February 1, 2018:

46% of Normal SWE

44% of Normal Precipitation

101% of Normal Precipitation Last Month

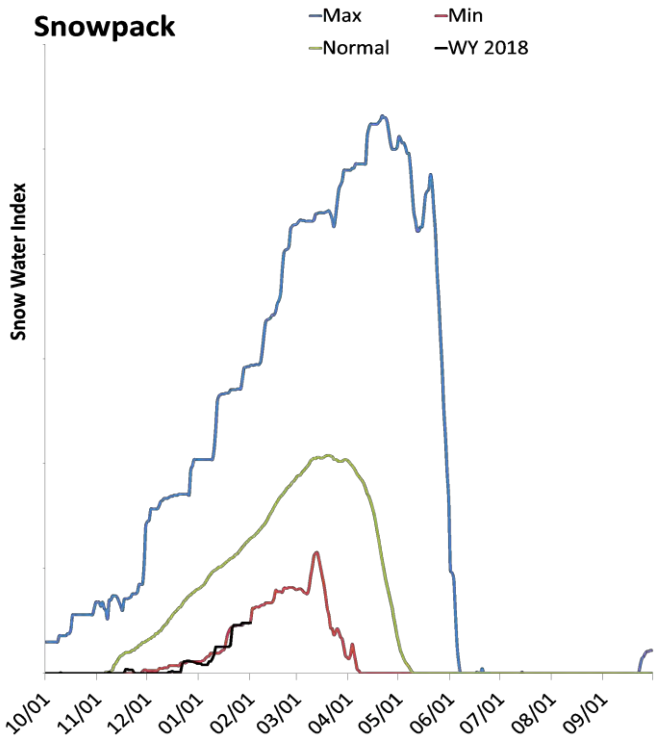
34% Saturation Soil Moisture

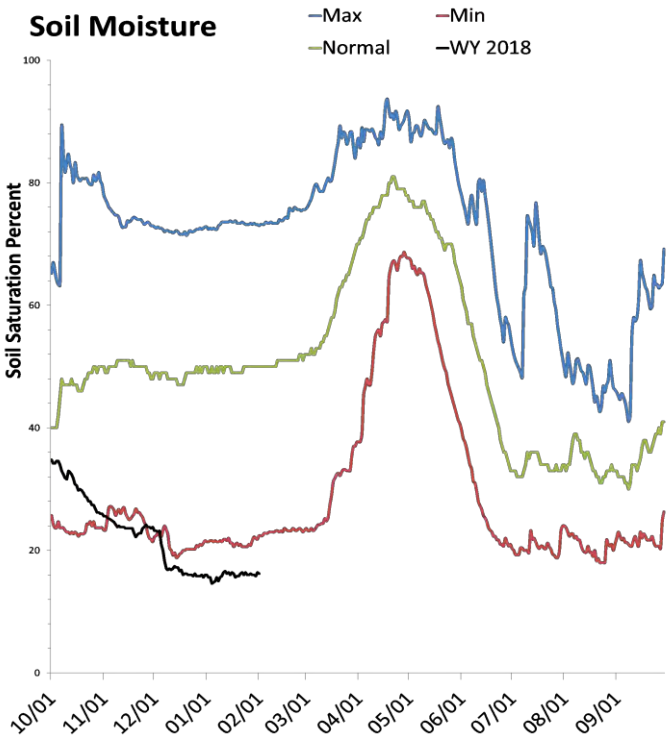
49% Reservoir Capacity

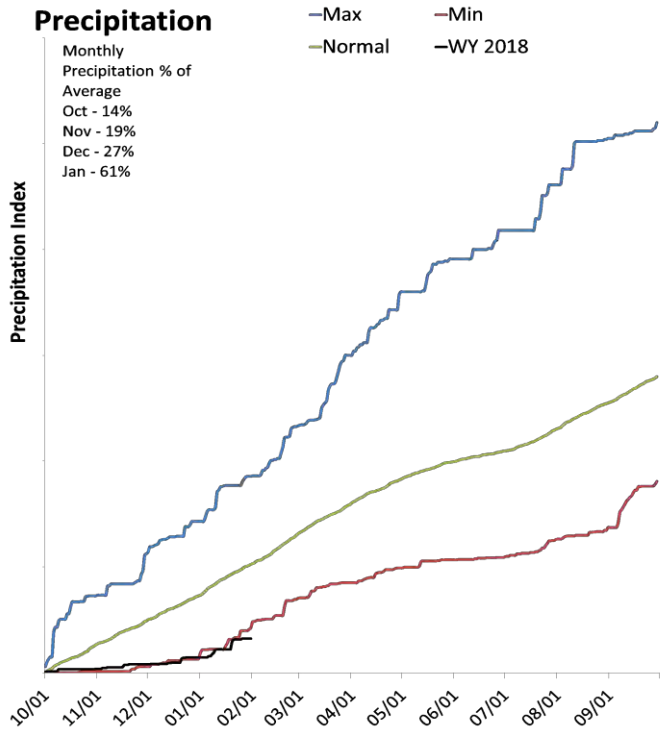
Southeastern Utah

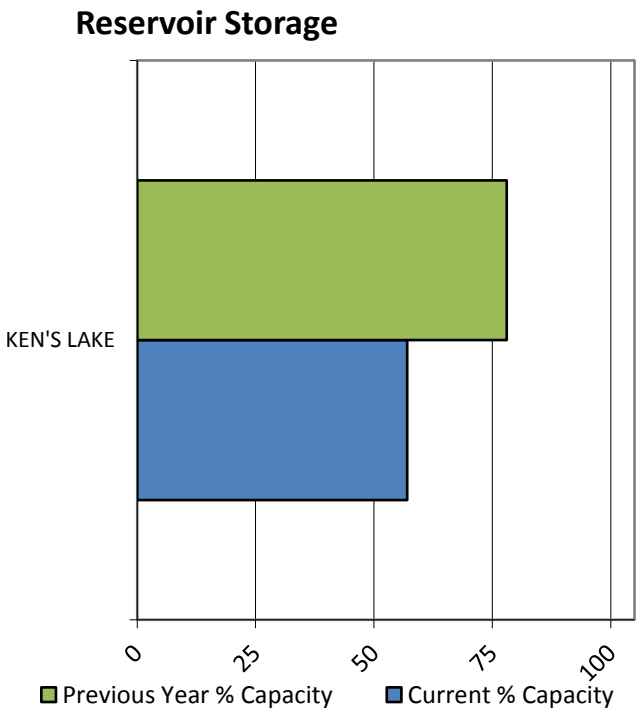
February 1, 2018

Snowpack in the Southeastern Utah is much below normal at 37% of normal, compared to 177% last year. Precipitation in January was much below average at 63%, which brings the seasonal accumulation (Oct-Jan) to 32% of average. Soil moisture is at 16% compared to 63% last year. Reservoir storage is at 57% of capacity, compared to 78% last year. Forecast streamflow volumes range from 6% to 52% of average. The surface water supply index is 19% for Moab.









SNOTEL Data

Data Current as of: 2/6/2018 6:48:21 AM

Southeastern Utah
Streamflow Forecasts - February 1, 2018

Southeastern Utah	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
		Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						
Mill Ck at Sheley Tunnel nr Moab	APR-JUL	0.75	1.42	2	47%	2.7	3.8	4.3
South Ck ab Resv nr Monticello	MAR-JUL	0	0.02	0.07	6%	0.14	0.33	1.09
Colorado R nr Cisco [2]	APR-JUL	1160	1750	2210	52%	2740	3610	4280
San Juan R near Bluff [2]	APR-JUL	63	145	220	20%	310	475	1100

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of January, 2018	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Ken's Lake	1.3	1.8	1.1	2.3
Basin-wide Total	1.3	1.8	1.1	2.3
# of reservoirs	1	1	1	1

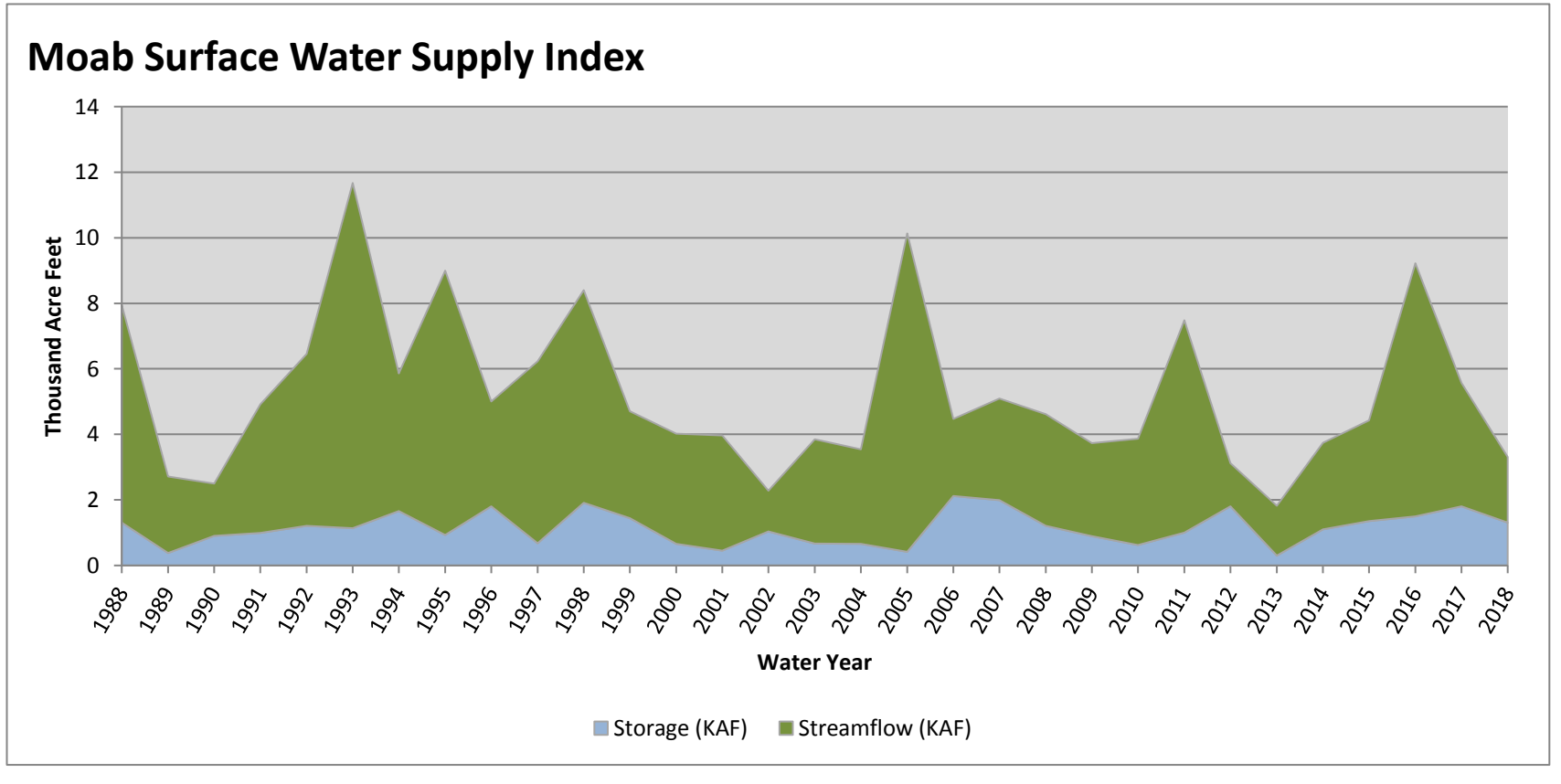
Watershed Snowpack Analysis February 1, 2018	# of Sites	% Median	Last Year % Median
Lasal Mountains	1	47%	165%
Lower San Juan	1	25%	183%
Lower Green	2	47%	210%
Henry Mountains	0		

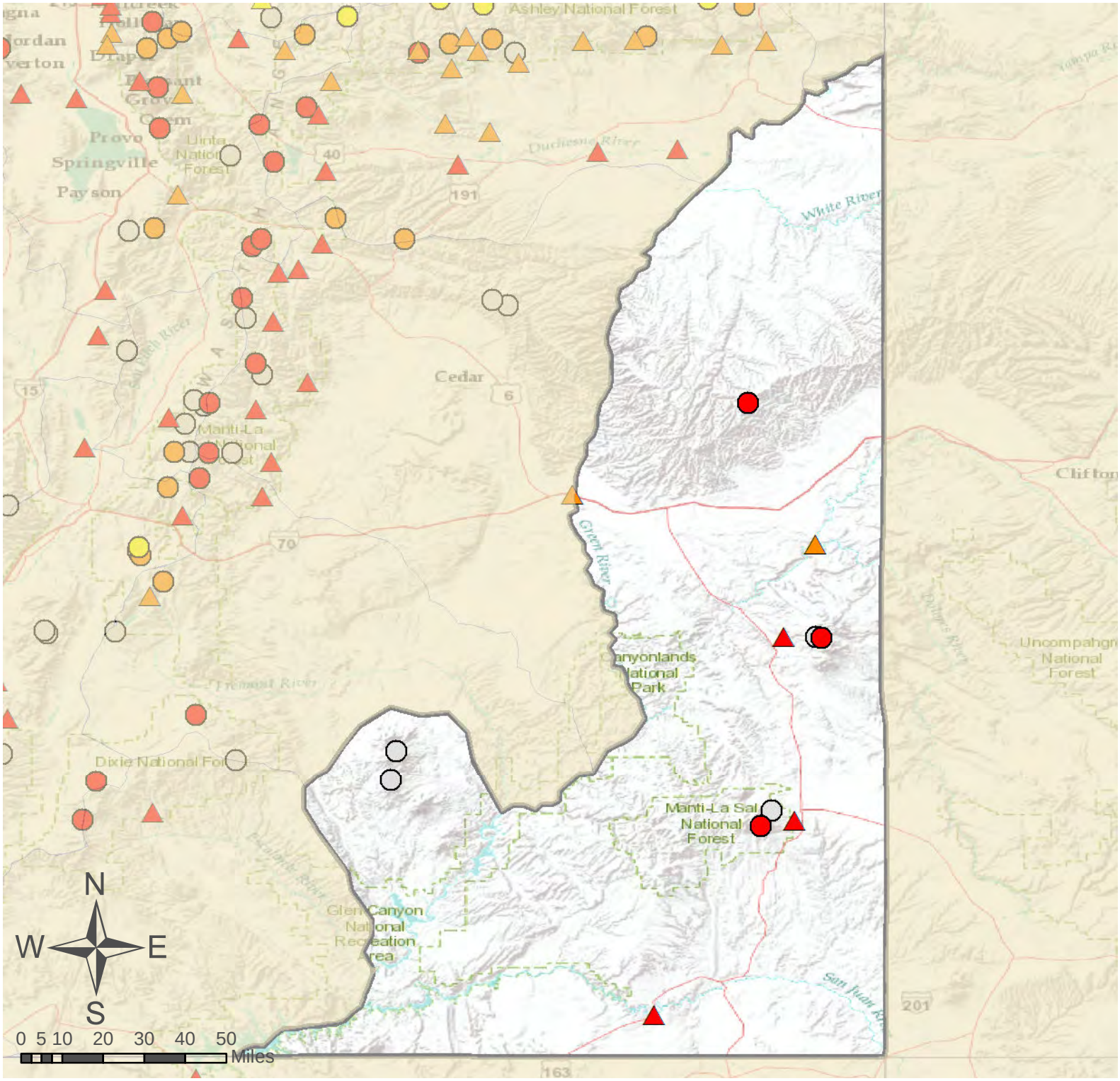
February 1, 2018

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Moab	**1.31**	**2.00**	**3.31**	**19**	**-2.6**	**89, 12, 04, 09**

*EOM, end of month; #SWSI, Surface Water Supply Index; ^KAF, thousand acre-feet.





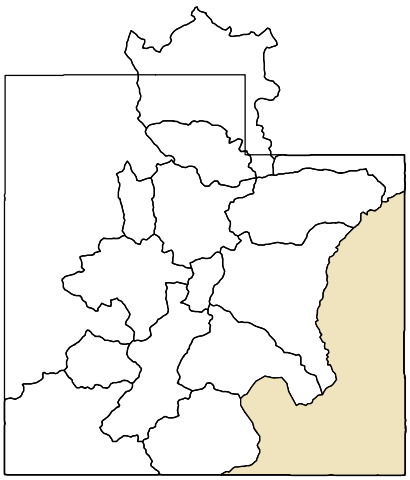
Southeastern Utah

SNOTEL Site

Forecast Point

% of Normal

- < 50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- > 150%
- No Normal



As of February 1, 2018:

37% of Normal SWE

32% of Normal Precipitation

63% of Normal Precipitation Last Month

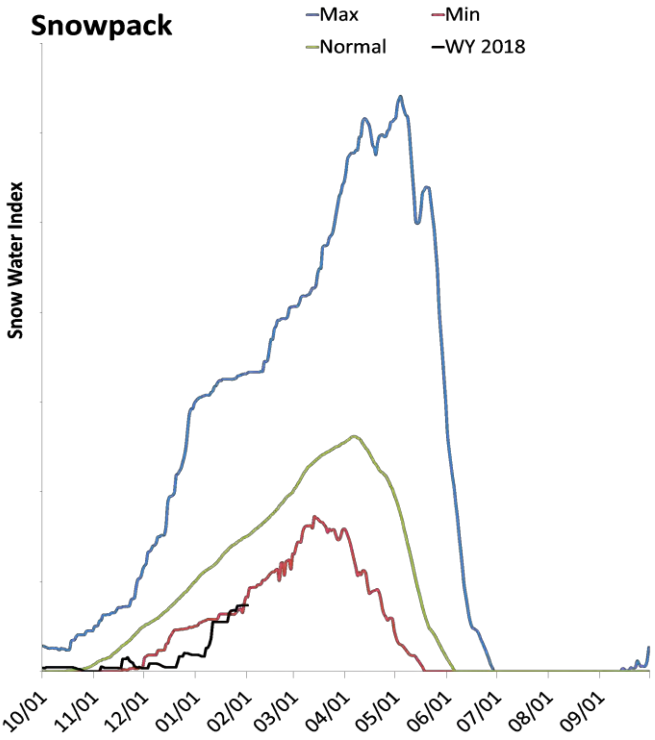
16% Saturation Soil Moisture

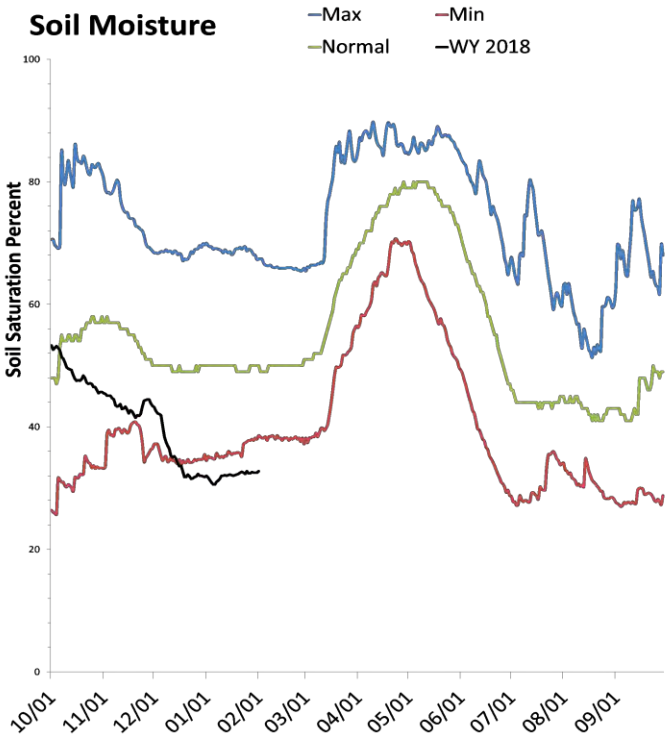
57% Reservoir Capacity

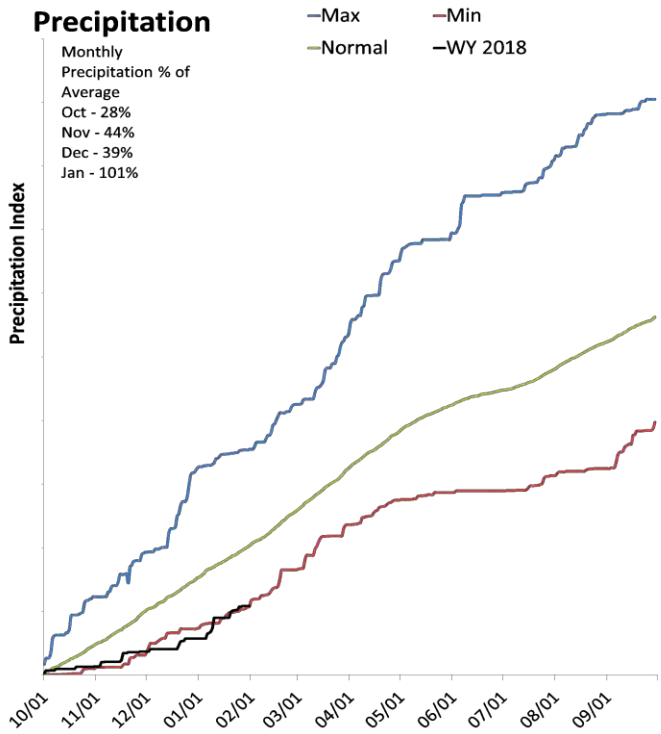
Dirty Devil Basin

February 1, 2018

Snowpack in the Dirty Devil Basin is much below normal at 49% of normal, compared to 160% last year. Precipitation in January was near average at 100%, which brings the seasonal accumulation (Oct-Jan) to 53% of average. Soil moisture is at 33% compared to 49% last year. Forecast streamflow volumes range from 36% to 53% of average.







SNOTEL Data

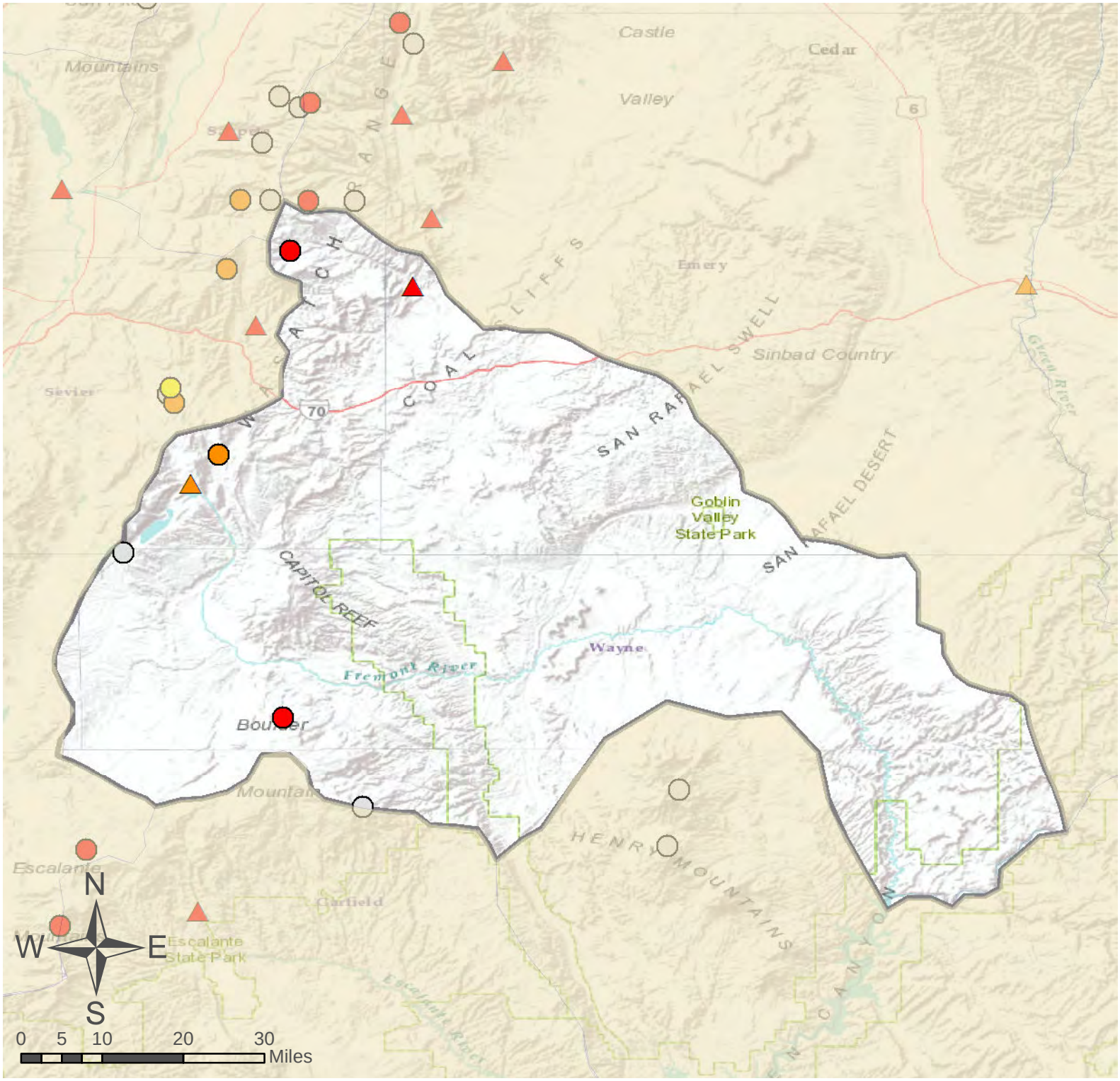
Data Current as of: 2/6/2018 6:48:14 AM

Dirty Devil
Streamflow Forecasts - February 1, 2018

Dirty Devil	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
		Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						
Muddy Ck nr Emery								
	APR-JUL	4	5.1	7.1	36%	9.4	13.3	19.9
Seven Mile Ck nr Fish Lake								
	APR-JUL	1.59	2.8	3.9	53%	5.1	7.1	7.3

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Watershed Snowpack Analysis February 1, 2018	# of Sites	% Median	Last Year % Median
Muddy Creek	3	42%	175%
Fremont River	3	59%	141%
Henry Mountains	0		



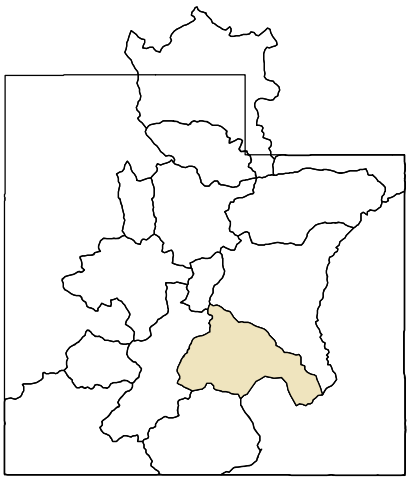
Dirty Devil Basin

SNOTEL Site

Forecast Point

% of Normal

- < 50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- > 150%
- No Normal



As of February 1, 2018:

49% of Normal SWE

53% of Normal Precipitation

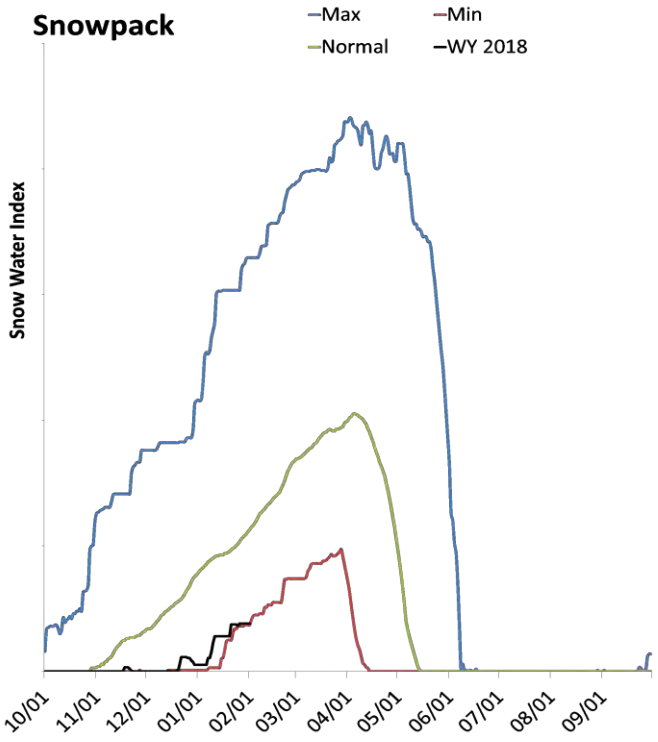
100% of Normal Precipitation Last Month

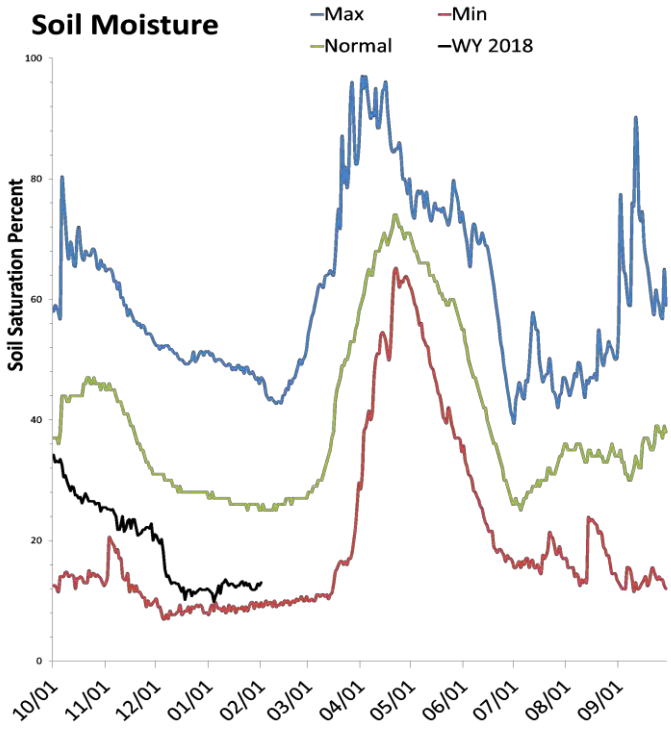
33% Saturation Soil Moisture

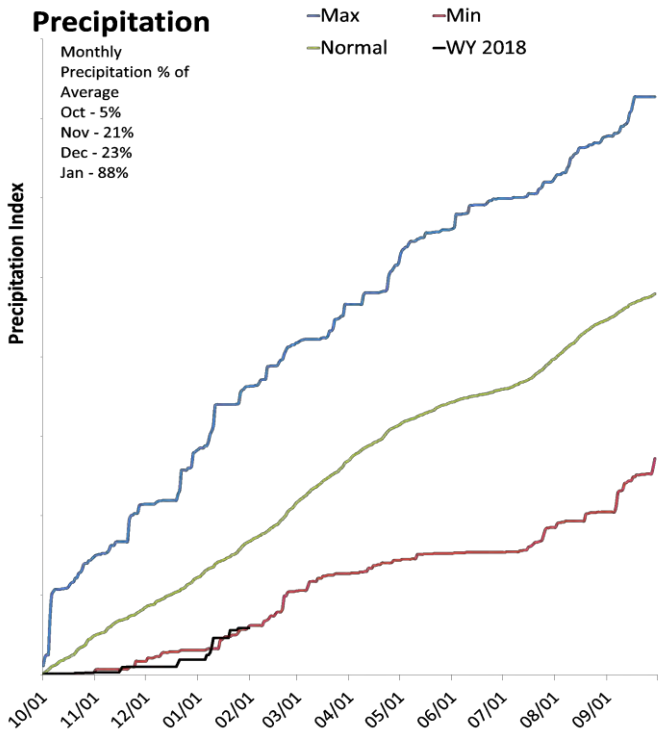
Escalante River Basin

February 1, 2018

Snowpack in the Escalante River Basin is much below normal at 34% of normal, compared to 132% last year. Precipitation in January was below average at 87%, which brings the seasonal accumulation (Oct-Jan) to 35% of average. Soil moisture is at 13% compared to 33% last year. The forecast streamflow volume for Pine Creek is 45% of average.







SNOTEL Data

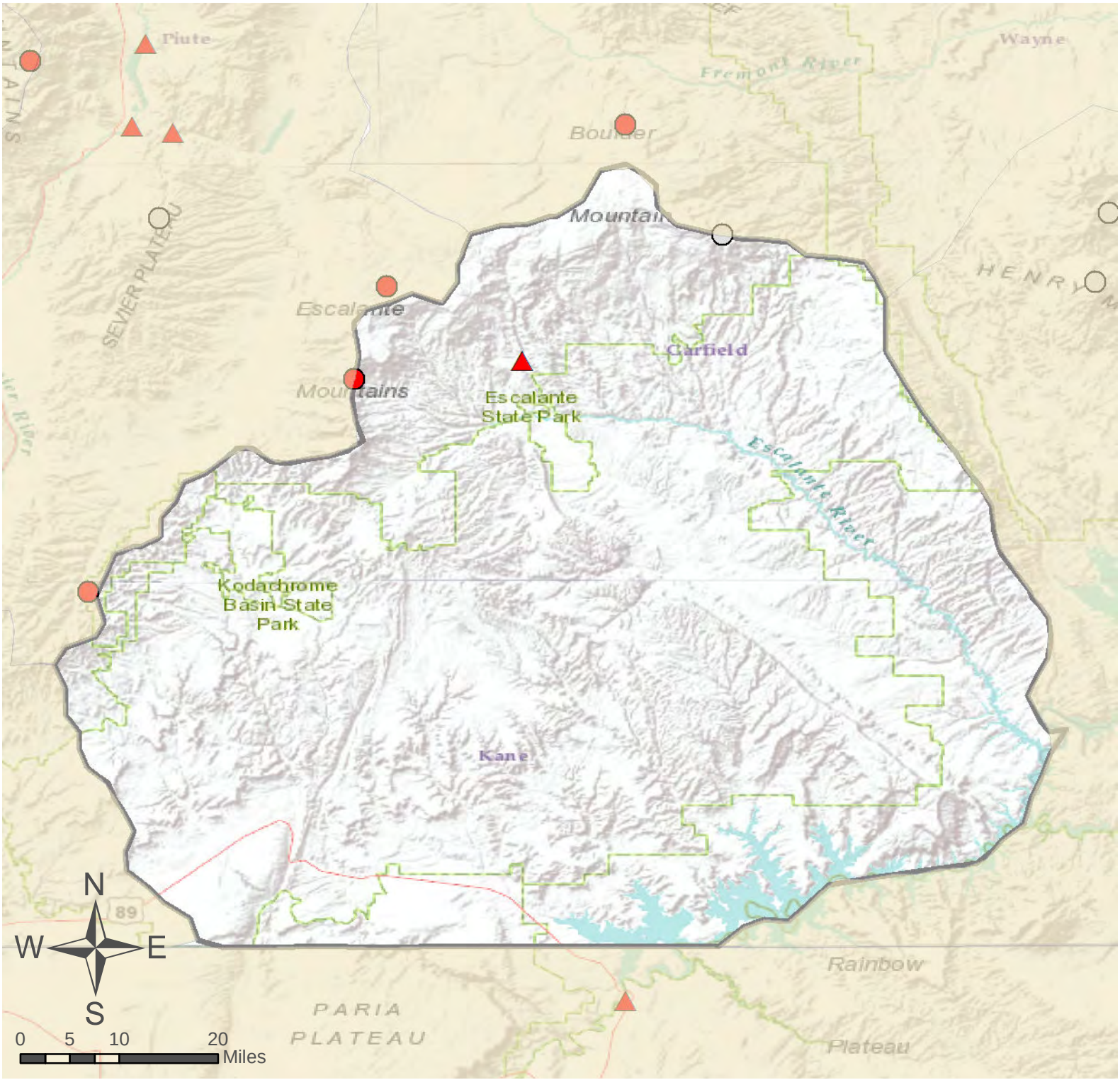
Data Current as of: 2/6/2018 6:48:43 AM

Escalante River
Streamflow Forecasts - February 1, 2018

Escalante River	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Pine Ck nr Escalante	APR-JUL	0.24	0.66	1.07	45%	1.58	2.5	2.4

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Watershed Snowpack Analysis February 1, 2018	# of Sites	% Median	Last Year % Median
Escalante River	3	34%	132%
Paria River	2	30%	184%



Escalante River Basin

SNOTEL Site

Forecast Point

As of February 1, 2018:

34% of Normal SWE

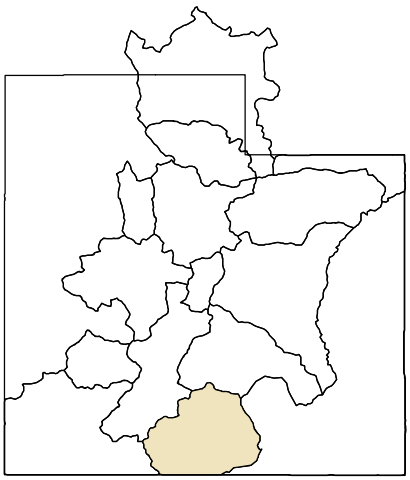
35% of Normal Precipitation

87% of Normal Precipitation Last Month

13% Saturation Soil Moisture

% of Normal

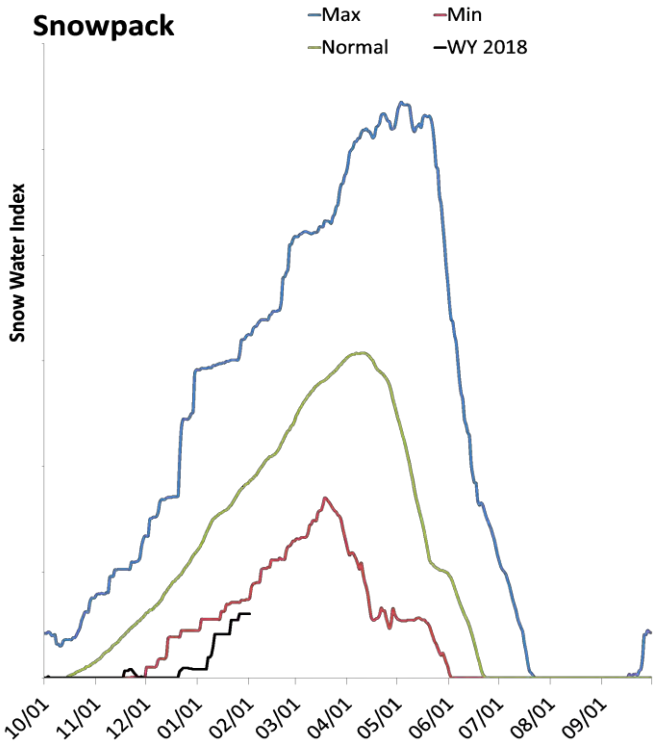
- < 50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- > 150%
- No Normal

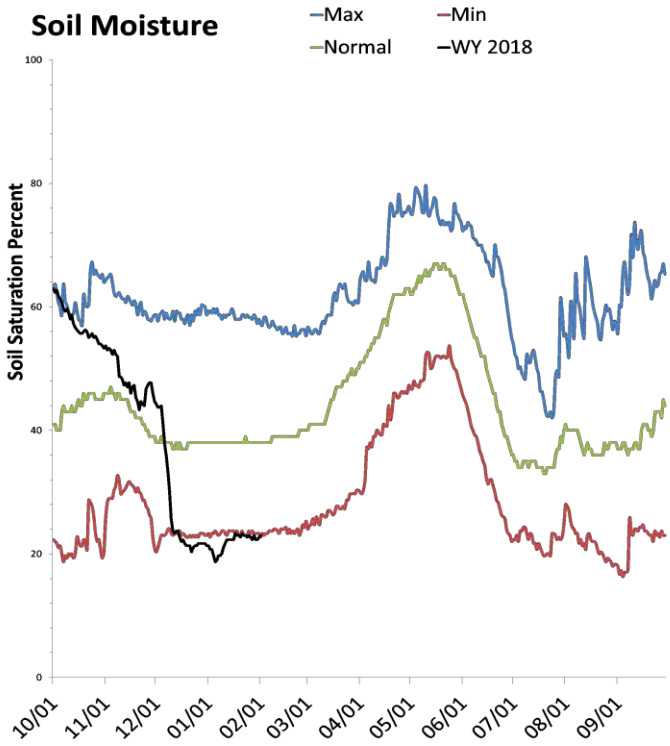


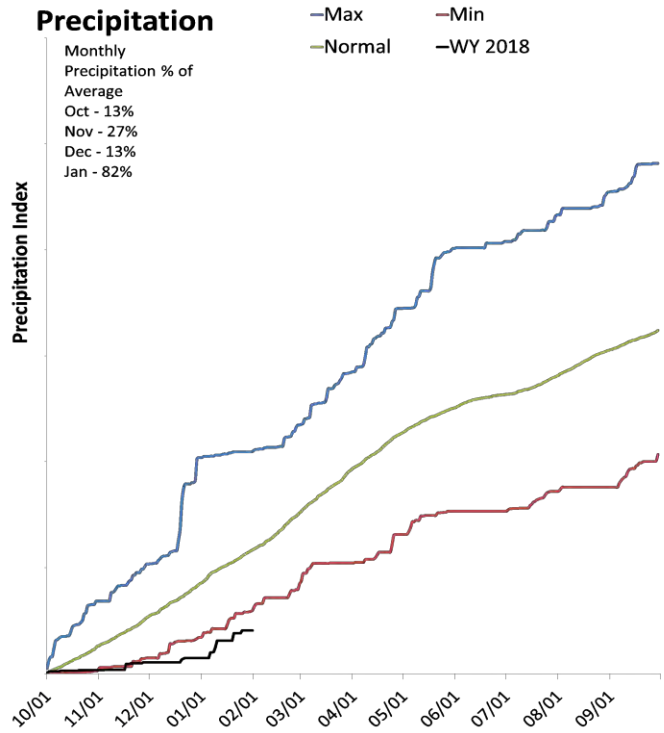
Beaver River Basin

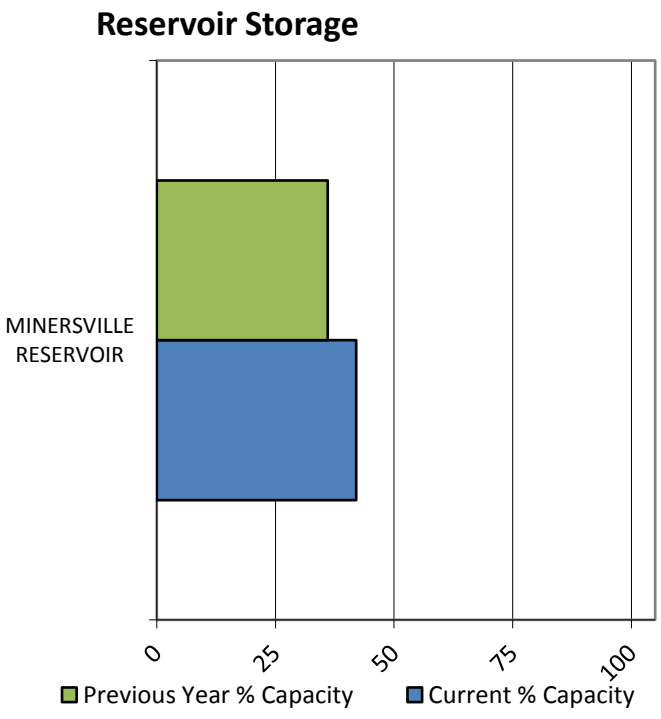
February 1, 2018

Snowpack in the Beaver River Basin is much below normal at 32% of normal, compared to 149% last year. Precipitation in January was below average at 83%, which brings the seasonal accumulation (Oct-Jan) to 35% of average. Soil moisture is at 23% compared to 50% last year. Reservoir storage is at 42% of capacity, compared to 36% last year. The forecast streamflow volume for the Beaver River is 24% of average. The surface water supply index is 5% for the Beaver River.









SNOTEL Data

Data Current as of: 2/6/2018 6:48:38 AM

Beaver River
Streamflow Forecasts - February 1, 2018

		Forecast Exceedance Probabilities for Risk Assessment Chance that actual volume will exceed forecast						
Beaver River	Forecast Period	90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Beaver R nr Beaver								
	APR-JUL	1.04	3.1	6.2	24%	12.2	21	26

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of January, 2018	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Minersville Reservoir	9.8	8.4	13.4	23.3
Basin-wide Total	9.8	8.4	13.4	23.3
# of reservoirs	1	1	1	1

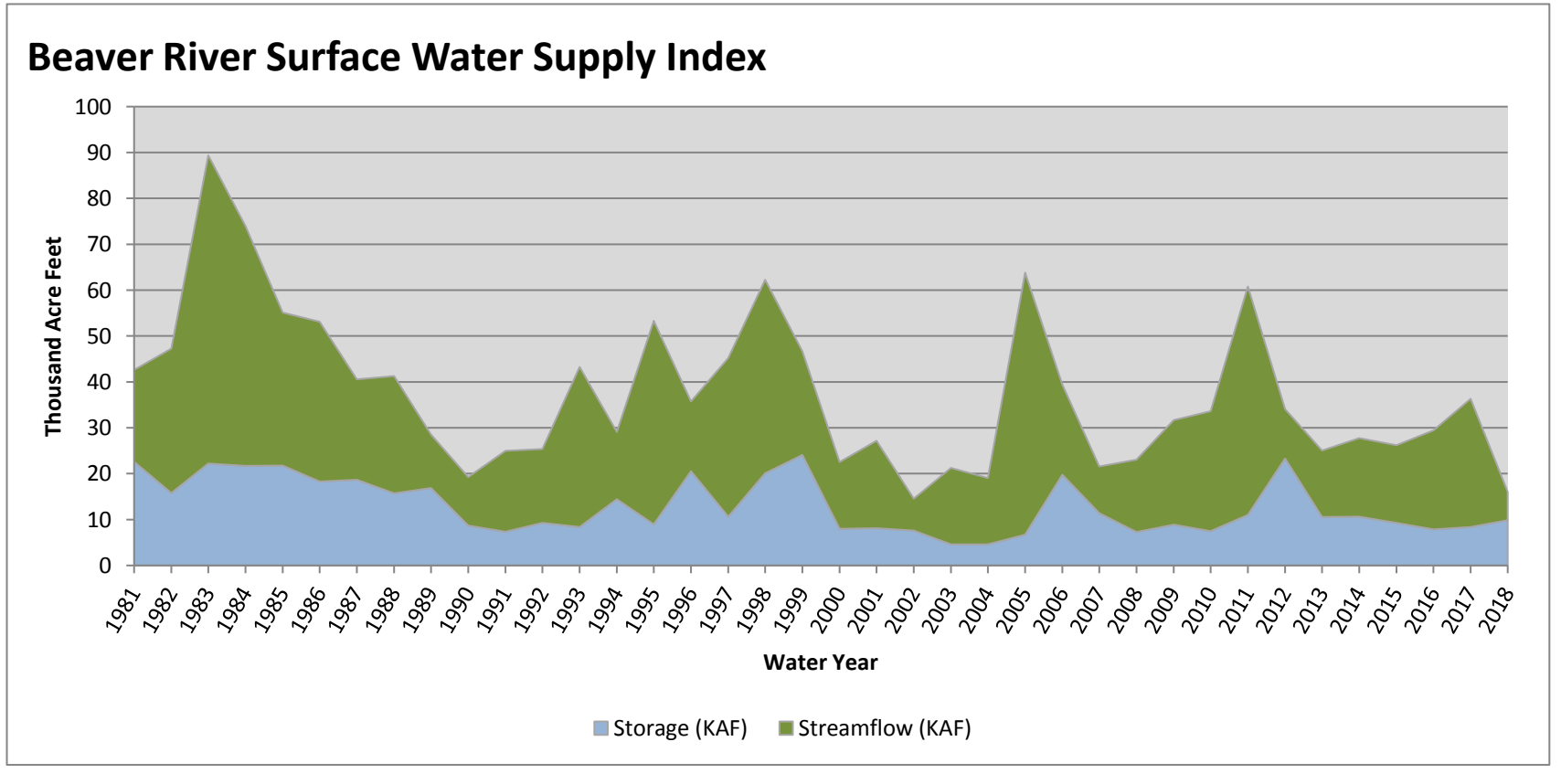
Watershed Snowpack Analysis February 1, 2018	# of Sites	% Median	Last Year % Median
Beaver River	3	32%	149%

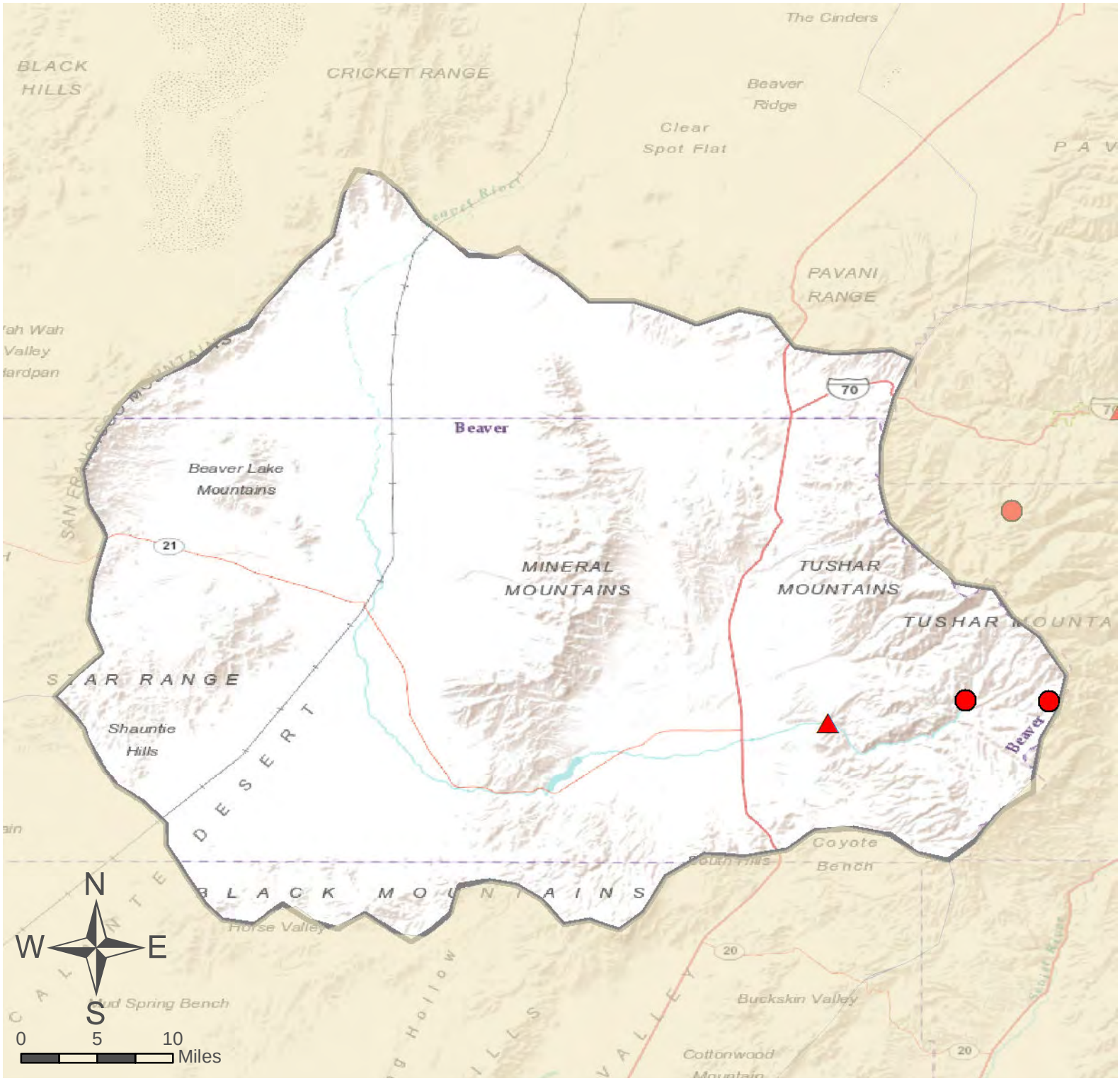
February 1, 2018

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Beaver River	**9.83**	**6.20**	**16.03**	**5**	**-3.74**	**02, 04, 90, 03**

*EOM, end of month; #SWSI, Surface Water Supply Index; ^KAF, thousand acre-feet.





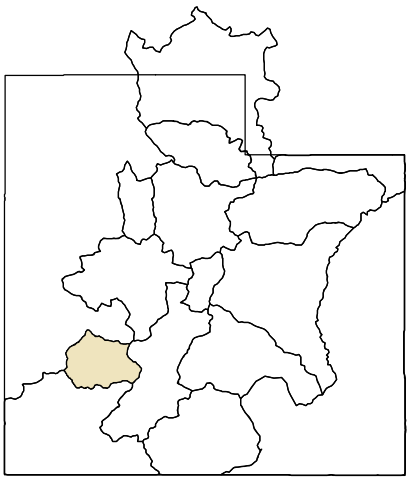
Beaver River Basin

SNOTEL Site

Forecast Point

% of Normal

- < 50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- > 150%
- No Normal



As of February 1, 2018:

32% of Normal SWE

35% of Normal Precipitation

83% of Normal Precipitation Last Month

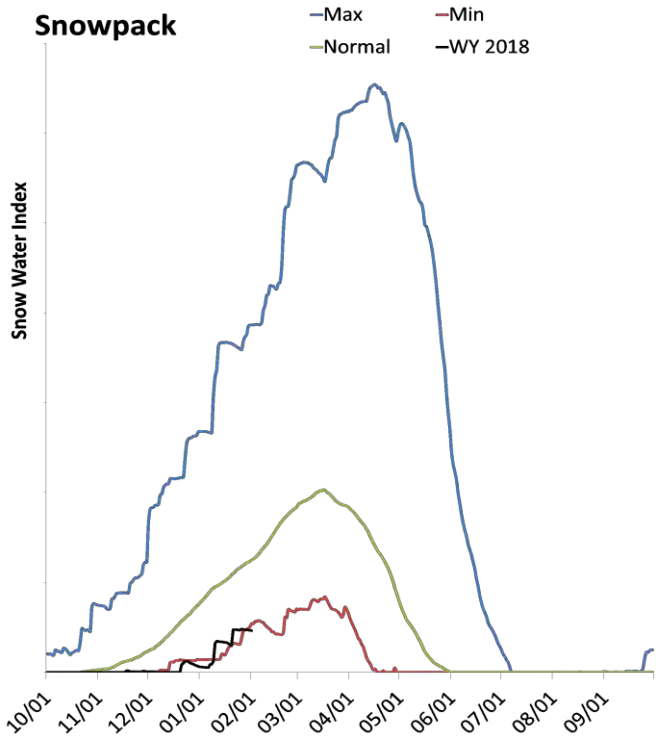
23% Saturation Soil Moisture

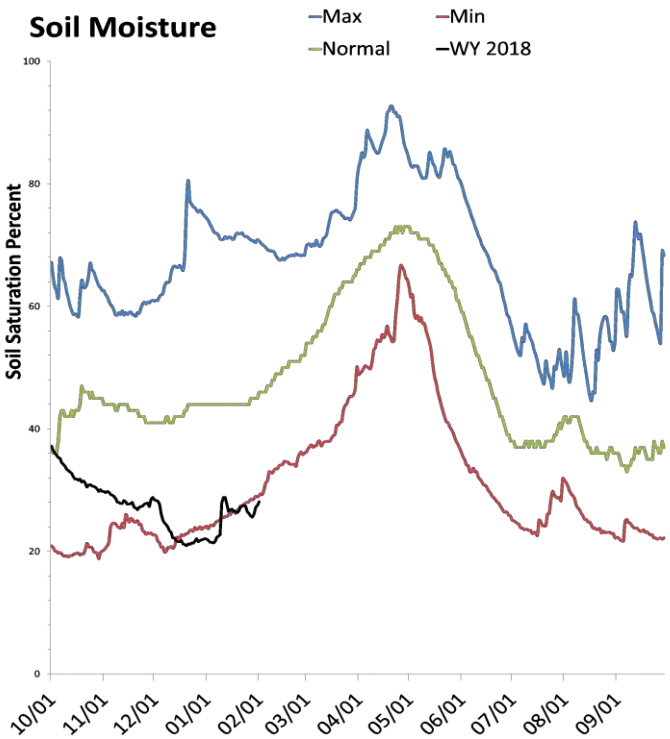
42% Reservoir Capacity

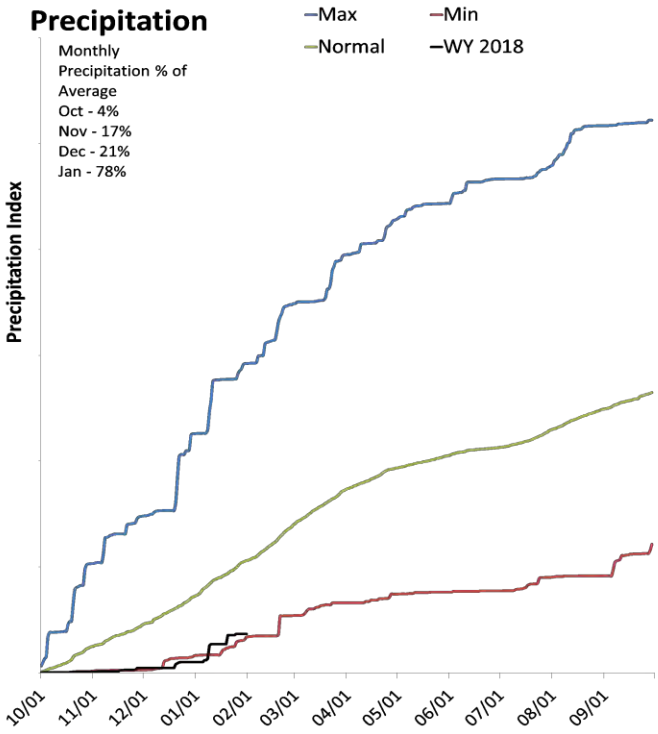
Southwestern Utah

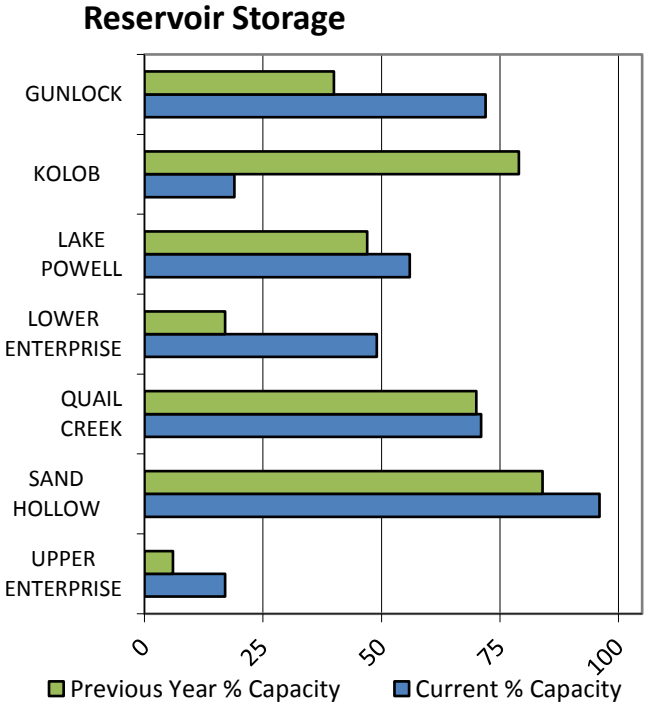
February 1, 2018

Snowpack in the Southwestern Utah is much below normal at 37% of normal, compared to 220% last year. Precipitation in January was below average at 78%, which brings the seasonal accumulation (Oct-Jan) to 35% of average. Soil moisture is at 28% compared to 48% last year. Reservoir storage is at 56% of capacity, compared to 47% last year. Forecast streamflow volumes range from 14% to 42% of average. The surface water supply index is 30% for the Virgin River.









SNOTEL Data

Data Current as of: 2/6/2018 6:48:50 AM

Southwestern Utah
Streamflow Forecasts - February 1, 2018

Southwestern Utah	Forecast Period	Forecast Exceedance Probabilities for Risk Assessment: Chance that actual volume will exceed forecast — 90% (KAF)	70% (KAF)	50% (KAF)	% Avg	30% (KAF)	10% (KAF)	30yr Avg (KAF)
Lake Powell Inflow [2]	APR-JUL	1240	2190	3000	42%	3930	5530	7160
Virgin R nr Hurricane	APR-JUL	0.55	6.4	14	22%	25	45	63
Virgin R at Virgin	APR-JUL	6.1	14.4	22	38%	31	48	58
Santa Clara R nr Pine Valley	APR-JUL	0.12	0.67	1.3	26%	2.1	3.8	5
Coal Ck nr Cedar City	APR-JUL	0.58	1.36	2.8	14%	7	13.3	19.4

1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions
3) Median value used in place of average

Reservoir Storage End of January, 2018	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
Lake Powell	13672.3	11359.3	17338.0	24322.0
Lower Enterprise	1.3	0.5	0.6	2.6
Upper Enterprise	1.7	0.6	3.1	10.0
Kolob Reservoir	1.1	4.4		5.6
Gunlock	7.5	4.2	6.5	10.4
Sand Hollow Reservoir	48.0	42.0		50.0
Quail Creek	28.4	28.0	26.0	40.0
Basin-wide Total	13711.1	11392.5	17374.2	24385.0
# of reservoirs	5	5	5	5

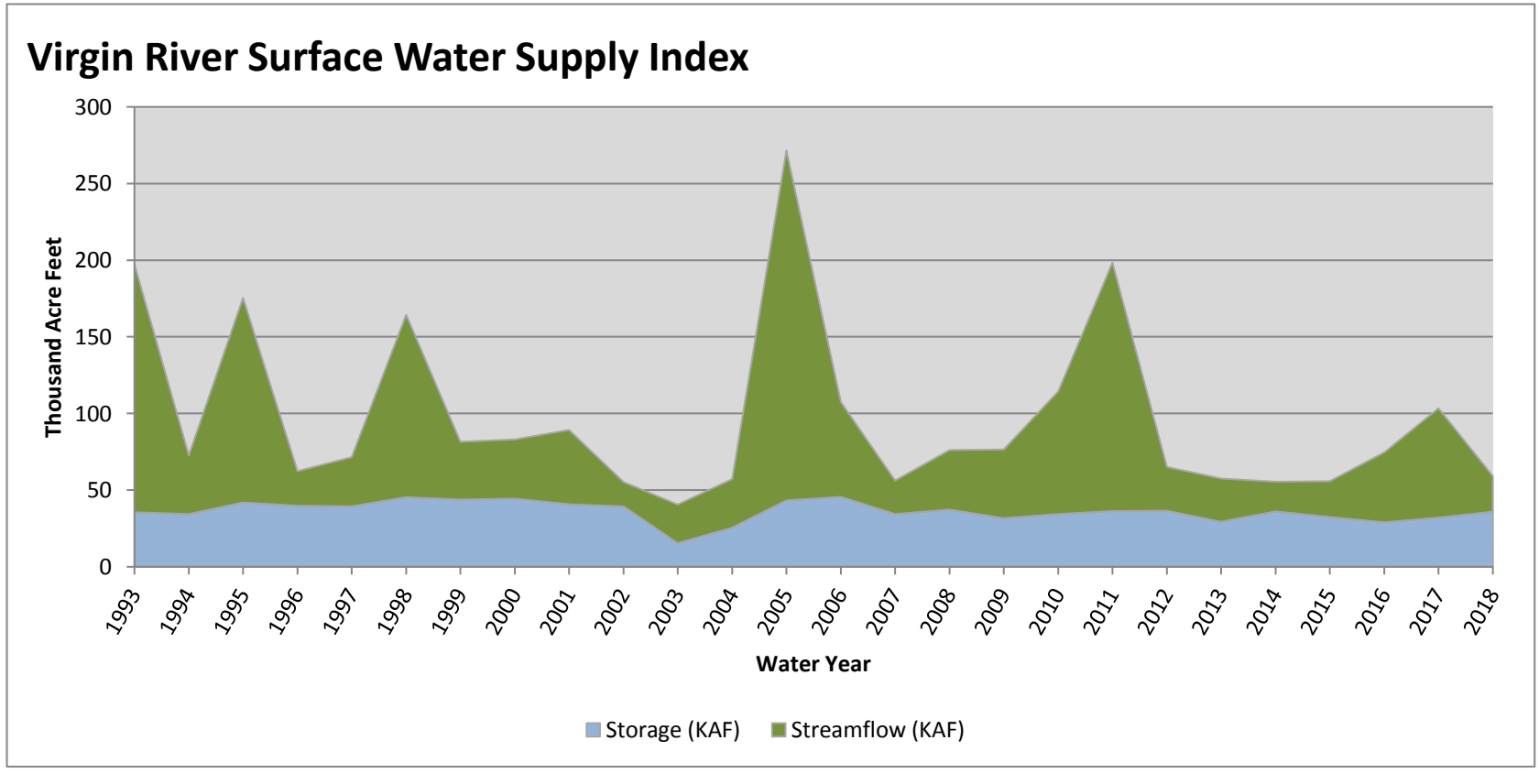
Watershed Snowpack Analysis February 1, 2018	# of Sites	% Median	Last Year % Median
Upper Virgin	8	34%	225%
Lower Virgin	2	21%	334%
Coal Parowan Creeks	4	46%	193%

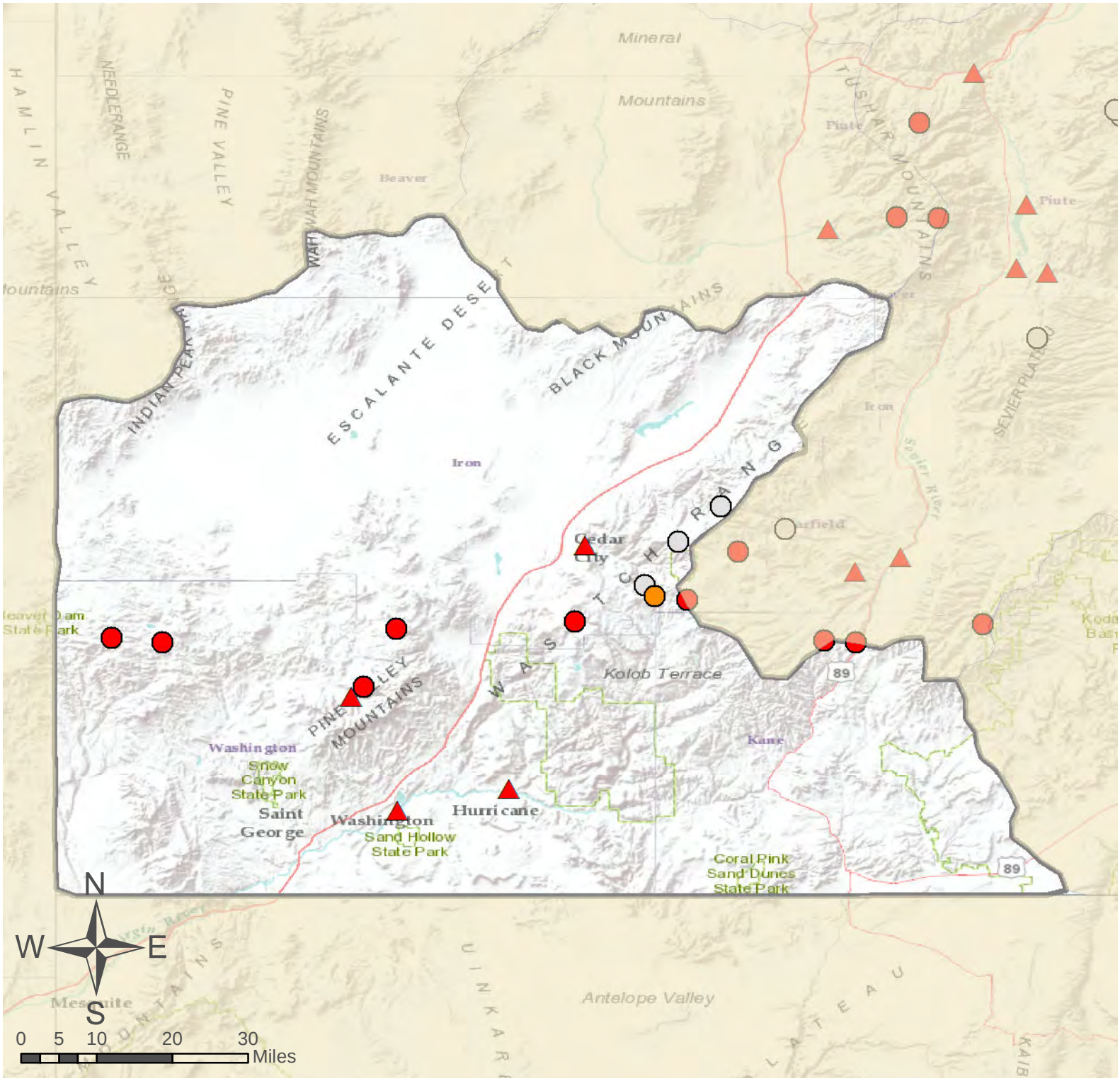
February 1, 2018

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF^	KAF^	KAF^	%		
Virgin River	**35.89**	**23.30**	**59.19**	**30**	**-1.7**	**04, 13, 96, 12**

*EOM, end of month; #SWSI, Surface Water Supply Index; ^KAF, thousand acre-feet.





Southwestern Utah

SNOTEL Site

Forecast Point

As of February 1, 2018:

37% of Normal SWE

35% of Normal Precipitation

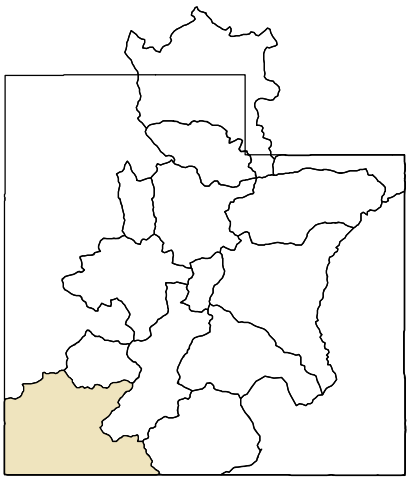
78% of Normal Precipitation Last Month

28% Saturation Soil Moisture

56% Reservoir Capacity

% of Normal

- < 50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- > 150%
- No Normal



February 1, 2018

Surface Water Supply Index

Basin or Region	Jan EOM* Storage	APR-JUL Forecast	Storage + Forecast	Percentile	SWSI#	Years with similiar SWSI
	KAF ^	*KAF ^*	*KAF ^*	*%*		
Bear River	**1011.7**	**105.0**	**1116.7**	**79**	**2.46**	**00, 82, 85, 97**
Woodruff Narrows	**48.0**	**82.0**	**130.0**	**46**	**-0.32**	**81, 07, 08, 06**
Little Bear	**9.9**	**25.0**	**34.9**	**44**	**-0.46**	**02, 94, 10, 16**
Ogden River	**77.5**	**73.0**	**150.5**	**54**	**0.32**	**10, 94, 16, 93**
Weber River	**338.2**	**172.0**	**510.2**	**54**	**0.32**	**94, 81, 10, 09**
Provo River	**983.1**	**52.0**	**1035.1**	**40**	**-0.83**	**14, 02, 13, 01**
Western Uinta	**182.2**	**82.0**	**264.2**	**67**	**1.39**	**16, 06, 95, 96**
Eastern Uinta	**35.2**	**44.0**	**79.2**	**21**	**-2.46**	**04, 94, 03, 81**
Blacks Fork	**10.0**	**72.0**	**82.0**	**36**	**-1.16**	**92, 90, 03, 91**
Smiths Fork	**6.0**	**22.0**	**28.0**	**36**	**-1.16**	**08, 90, 85, 88**
Price River	**50.0**	**14.0**	**64.0**	**62**	**0.96**	**08, 12, 17, 87**
Joe's Valley	**45.3**	**25.0**	**70.3**	**23**	**-2.24**	**92, 94, 16, 12**
Ferron Creek	**1.2**	**16.0**	**17.2**	**3**	**-3.95**	**13, 02, 12, 90**
Moab	**1.3**	**2.0**	**3.3**	**19**	**-2.6**	**89, 12, 04, 09**
Upper Sevier	**61.8**	**23.0**	**84.8**	**13**	**-3.1**	**16, 03, 90, 92**
San Pitch	**1.6**	**6.8**	**8.4**	**5**	**-3.74**	**13, 02, 16, 15**
Lower Sevier	**54.7**	**36.0**	**90.7**	**10**	**-3.31**	**17, 92, 16, 03**
Beaver River	**9.8**	**6.2**	**16.0**	**5**	**-3.74**	**02, 04, 90, 03**
Virgin River	**35.9**	**23.3**	**59.2**	**30**	**-1.7**	**04, 13, 96, 12**

**EOM, end of month; # SWSI, surface water supply index; ^KAF, thousand acre-feet.*

What is a Surface Water Supply Index?

The Surface Water Supply Index (SWSI) is a predictive indicator of total surface water availability within a watershed for the spring and summer water use seasons. The index is calculated by combining pre-runoff reservoir storage (carryover) with forecasts of spring and summer streamflow which are based on current snowpack and other hydrologic variables. SWSI values are scaled from +4.1 (abundant supply) to -4.1 (extremely dry) with a value of zero (0) indicating median water supply as compared to historical analysis. SWSI's are calculated in this fashion to be consistent with other hydroclimatic indicators such as the Palmer Drought Index and the Precipitation index.

Utah Snow Surveys has also chosen to display the SWSI value as well as a PERCENT CHANCE OF NON-EXCEEDANCE. While this is a cumbersome name, it has the simplest application. It can be best thought of as a scale of 1 to 99 with 1 being the drought of record (driest possible conditions) and 99 being the flood of record (wettest possible conditions) and a value of 50 representing average conditions. This rating scale is a percentile rating as well, for example a SWSI of 75% means that this years water supply is greater than 75% of all historical events and that only 25% of the time has it been exceeded. Conversely a SWSI of 10% means that 90% of historical events have been greater than this one and that only 10% have had less total water supply. This scale is comparable between basins: a SWSI of 50% means the same relative ranking on watershed A as it does on watershed B, which may not be strictly true of the +4 to -4 scale.

For more information on the SWSI go to: www.ut.nrcs.usda.gov/snow/ on the water supply page. The entire period of historical record for reservoir storage and streamflow is available.

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YOU MAY OBTAIN THIS PRODUCT AS WELL AS CURENT SNOW, PRECIPITATION, TEMPERATURE AND SOIL MOISTURE, RESERVOIR, SURFACE WATER SUPPLY INDEX, AND OTHER DATA BY VISITING OUR WEB SITE @:
https://www.nrcs.usda.gov/wps/portal/nrcs/main/ut/snow/

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Utah Water Supply Outlook Report

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